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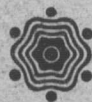
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OUTLINES OF THE

BY THOMAS ELMER WILL.

VIII. From Hayes to Garfield.

THE law of January 14, 1875, authorizing the resumption of specie payments, provided, as seen, for the gradual destruction of greenbacks until the amount remaining should be \$300,000,000; the vacuum thus created to be filled by national bank notes, furnished to the banks as usual by the government *gratis*, and taxable by the banks before being permitted to enter the circulation.

MORE SCOPE FOR BANK NOTES.

Five days later, namely, on January 19, 1875, the following act, providing for further extension of the privileges of national bankers, was approved.

An act to remove the limitation restricting the circulation of banking associations issuing notes payable in gold.

Be it enacted . . . That so much of section five thousand one hundred and eighty-five of the Revised Statutes of the United States as limits the circulation of banking associations organized for the purpose of issuing notes payable in gold, severally to one million dollars, be and the same is hereby repealed; and each of such existing banking associations may increase its circulating notes, and new banking associations may be organized, in accordance with existing law, without respect to such limitation.

This act, as may be observed, was in line with the policy of supplanting public money, issued by the government directly to the people, with semi-private money, created like the greenbacks by the government but donated to the national banks.²

BUT THE GREENBACK MUST STAY.

The defeat of silver remonetization by the Bland-Allison compromise produced, however, one effect that may not have been anticipated by the gold monometalists; it stopped the destruction of the greenbacks. On May 31, 1878, the following act was approved.

¹ Copyrighted, 1898, by the author.

² See INDUSTRIALIST for April, 1898, p. 227 ff.



HON. ED. SECREST.

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OUTLINES OF THE FINANCIAL HISTORY OF THE UNITED STATES.¹

BY THOMAS ELMER WILL.

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An act to forbid the further retirement of United States legal-tender notes.

Be it enacted. . . . That from and after the passage of this act it shall not be lawful for the secretary of the treasury or other officer under him to cancel or retire any more of the United States legal-tender notes. And when any of said notes may be redeemed or be received into the treasury under any law from any source whatever and shall belong to the United States, they shall not be retired, canceled or destroyed, but they shall be reissued, and paid out again and kept in circulation: *Provided*, That nothing herein shall prohibit the cancelation and destruction of mutilated notes and the issue of other notes of like denomination in their stead, as now provided by law.

All acts and parts of acts in conflict herewith are hereby repealed.

This act, then, not only prohibited the further retirement and cancelation of government paper money, but it provided that such money of this character as should be redeemed or received into the treasury should be reissued and kept in circulation. This requirement for the reissue of government paper money, tho redeemed, has been severely criticised by gold monometalists and national bank paper advocates on the ground that it permits the operation of the "endless chain"—to be considered later. Obviously, if this provision were repealed it would be possible for the enemies of the greenback to secure its abolition by simply presenting it at the treasury for redemption. Whether the paper when redeemed were destroyed or simply locked up would be to them a matter of indifference. If, further, in order to secure the gold with which to redeem, the treasury were compelled to sell bonds, so much the better for those presenting the paper for redemption; for the practical effect would be the conversion of legal-tender money into an interest-bearing, probably long-time, bonded debt, furnishing a safe and desirable investment, and also providing the foundation for more national bank notes.

The amount of greenbacks in existence at the time of the passage of the above act was \$346,681,016. Tho twenty years have since elapsed, and the greenback has during all this period been regarded with implacable hostility by national bankers and currency contractionists, and tho \$426,190,220 were actually redeemed between January 1, 1879, and June 30, 1896, it has never yet been possible to resume the policy rudely interrupted on May 31, 1878, of reducing the greenback to ashes.¹

Following these acts came the refunding acts of January 25 and February 26, 1879, already discussed.² By the refunding acts the

¹ Treasury Circular 123, p. 10. Bolles's Financial History, vol. III, p. 297.

² See INDUSTRIALIST for June, 1898, p. 389 ff.

day on which our national debt might be repaid without being bought up on the market at a heavy premium was pushed ever farther into the future, and a war debt, most of which might by a rational system of finance have been paid as the war progressed, was fastened upon a generation then unborn.

HARD TIMES.

The Bland-Allison compromise, resulting tho it did in the addition of some two million dollars per month to the circulating medium, could do but little to offset the effects of closing the mints of several important nations against the coinage of silver and attempting at the same time to resume specie payments in the United States with one metal, when statesmen before 1873 had been unable to explain how resumption could be effected even with two. The hard times still continued. Representative Kelley on February 14, 1879, declared in the house:

Ruin has pursued, as an avenging demon, enterprise wherever it has engaged in productive business. He only has profited by their toil who has wrapped his talent in a napkin of untaxed government bonds, and brought it forth for use only when the products of labor, energy and enterprise were to be sacrificed at sheriff's or other forced sale.

But, sir, the sheriff's sale was not the only joyous event with which the stricken people of Philadelphia were made to welcome the great fact of the equivalency between our paper money and gold. For on the first day of the "glad New Year" the owners of 13,582 properties, within the limits of the city, on opening their morning papers, were pleasantly greeted by name, by the receiver of taxes, with notice that their taxes for 1878 were default, and that unless they were paid on or before the 15th of the month, preliminary steps would be taken to secure their collection. Living in enforced idleness, as thousands of the most industrious and thrifty of them are, think you that this was a grateful New Year's greeting? . . .

Sheriff Wright, on January 6, will begin the largest sale of real estate ever held by any sheriff in this city. There are 692 writs, covering about 1000 properties. The sale on the first day will begin at 4 o'clock, in the new courthouse, and extend from No. 370 on the list to No. 692.

The conditions in European countries whose workers maintained a lower standard of living than American workers and were not afforded the relief made possible by America's unsettled western lands were even worse. In the latter part of 1873 began the terrific fall in prices with which all students of financial history are familiar. In the three years preceding this date England was enjoying unusually good times. Mr. Gladstone spoke of the prosperity as increasing by "leaps and bounds" while Professor Marshall declared that this prosperity was general, affecting both employers and employees.

With the beginning of the drop in prices, which the contraction of the world's monetary volume necessarily brought about, the scene changed. In 1876 Parliament found it desirable to appoint a commission to inquire into the causes of industrial depression. Unemployment was found to have increased, strikes multiplied, 161 occurring in 1877 alone; while pauperism increased eleven per cent in the same year. In 1878 the "financial gloom" deepened; a crisis occurred in the cotton trade; "in the coal and iron industries the situation was equally gloomy" with bankruptcies common.

Conditions in Germany were similar to those in America and England. The speech from the throne read February 6, 1878, refers to "the difficulties affecting the development of our industry, doubly felt at the present time, in the lasting depression of commerce." As in England, commissioners were appointed to inquire into the conditions of trade and industry. Labor troubles became common. Tens of thousands of unemployed men and rioters assembled in the streets and displayed red revolutionary emblems. Two attempts were made on the life of the emperor. Bills were introduced in the Reichstag for the forcible repression of socialism.

In France the conditions were similar to those prevailing in the countries named. Here, too, a parliamentary committee was appointed in 1878 to inquire into the cause of the depressed conditions in trade and manufactures.

To relieve the stringency, tariff laws were passed in Germany, France and Italy, each country attempting to protect itself against its neighbors and to relieve, by restricting trade, the evils resulting from a diminution in the machinery with which trade is performed.

THE MONETARY CONFERENCE OF 1878.

The monetary conference, provided for by the Bland-Allison act, met in Paris in 1878, holding seven sessions, continuing from August 10 to August 29. The countries represented were Austro-Hungary, Belgium, France, Great Britain, Greece, Italy, Netherlands, Russia, Norway, Sweden, Switzerland and the United States. The commissioners on the part of the United States were Messrs. Reuben E. Fenton, W. S. Groesbeck and Francis A. Walker, assisted by Mr. S. Dana Horton as secretary of the American commission. The proceedings of this conference were published in a report of over nine hundred pages.

In this conference, as in the international committee and the Paris conference of 1867, the anti-silver forces were strongly repre-

sented. England, as in 1867, expressed herself as absolutely committed to the single gold standard. Germany refused to send a delegate, even when expressly invited by the conference itself to do so. Mr. Feer-Herzog of Switzerland was, as usual, strongly against the use of silver. Mr. Broch of Norway, and Mr. Mees of Holland, expressed similar views. Mr. Pirmez of Belgium declared that the mints be generally opened to the coinage of both gold and silver should at the old ratio, "the increased value gained by silver . . . will be attended, as regards gold, by a precisely equal reduction in value."¹ By this argument he betrayed the real objection of the creditor countries to the use of silver; the reduction, namely, in the value of the gold in which the principal and interest of their claims upon debtor nations must be paid. Like Mr. Gladstone² they were not prepared "to perform this supreme act of self-sacrifice."

INDEPENDENT ACTION.

One conclusion of this conference was important. It was that expressed in the following words: "It is necessary to maintain in the world the monetary functions of silver as well as gold, but that the selection for use of one or the other of the two metals, or of both simultaneously, should be governed by the special position of each state or group of states."³ The conference, i. e., unguardedly admitted that each nation should decide for itself upon the money system which it would employ, instead of relying upon other nations for help in establishing its system. The policy, in other words, of "going it alone" received the sanction of this conference, largely gold standard tho it was. The question of a common ratio between the two metals it thought it not even worth while to discuss.⁴

That in a country so strongly committed as the United States to the policy of "going it alone" in the matters of international trade and tariffs there should be a strong sentiment in favor of equally independent action regarding its financial system there could be little doubt. Why a nation should seek to protect itself against the world by means of tariffs and then leave its money system and its foreign obligations at the mercy of foreign creditor nations might well be expected to arouse question. Independent action, it is true, might be delayed in the hope of united action; but now, that the attempt to secure such action had miserably failed, it might well be expected that

¹ Report of the conference, p. 121.

² Speech in house of commons, Feb. 28, 1893.

³ Conference report, p. 214.

⁴ Conference report, p. 214.

the United States would insist on standing on its own feet and, like the adult of full age, doing business on its own account.

HOW IT MIGHT BE PREVENTED.

It now became evident to the financial classes that if such action were to be prevented the financial stringency must be relieved and a measure of prosperity dealt out to the general public. In a country maintaining highly developed industries, an abundance of skilled and willing labor, efficient business men and a financial system consisting largely of credits capable of being issued or withdrawn by members of a banking system, themselves closely organized and centralized and under the direction of skilled managers at the financial center of the country, to produce prosperity or adversity at will is a simple matter. By lending the cash actually under their control, by "extending accommodations" and inflating credits the engineers of this gigantic system may increase the volume of the exchange medium as really as tho gold and silver had been coined or United States notes had been printed and injected into the circulation. Exchanges which hitherto it had been impossible to make could now be made; prices till now falling would begin to rise; business would feel the stimulus as the physical body feels the strength that comes from the consumption of wholesome food and the increase of the volume of blood—the life of the body. Conversely, by refusing "accommodations," contracting credits and calling in loans a powerful brake may be applied to the wheels of industry. Exchange media are thus as effectually destroyed for the time being as tho greenbacks had been burned or gold and silver coins had been melted into bullion for use in the arts. The effect upon the body politic is now similar to that produced upon the physical body by bleeding. Strength gives place to weakness; and if the process is but carried sufficiently far the whole industrial and commercial system may be sapped of its vitality and compelled to lie prostrate and exhausted at the feet of those who hold its life in their hands.

PROSPERITY MADE TO ORDER.

The policy was now adopted in Europe of issuing large quantities of paper money. The circulation of the Imperial Bank of Germany was increased between January 1, 1879, and January 1, 1880, by over thirty-two million dollars, while that of the Bank of France was increased between January 29, 1880, and January 27, 1881, by over forty million dollars.¹

¹ Report of comptroller of currency, p. 65.

Some of the great banks of the world, furthermore, reduced their gold holdings: the Bank of France in 1879 "lost" over fifty-four million dollars in gold, the Bank of England between August 1, and November 26 "lost" thirty-five million dollars, while the coin and bullion in the Bank of Germany fell between September 1, and October 15, 1879, fifteen million dollars. The gold in the United States treasury was also reduced in the last half of 1879 and the first half of 1880 by nine million dollars.

This substantial increase in the money volume of the countries named produced the inevitable effect. Prices were borne aloft like a boat upon the bosom of a lake, the level of which is raised by a large influx of water. The rising prices, in accordance with the Ricardian law, discouraged exports and encouraged imports, the balance of trade being paid for in gold. The principal inflation having occurred abroad rather than within the United States, this country now became a heavy exporter of goods, and the flow of gold in payment for balances tended largely toward the United States, seventy-eight million dollars pouring in during 1879 against a single million of dollars in the preceding year.

This abundance of money tended to make money still more abundant. In accordance with the law of value, as money grew plenty it grew correspondingly cheap. Those holding money out of use for the unearned increment in its value which follows from contraction, now hastened to unload it in exchange for other forms of property, as real estate, the price of which would rise as money fell; and in exchange for labor with which to produce goods to meet the enlarged consumption which always accompanies good times. "Locked up capital" was thus thrown upon the market, making money more abundant and prices and wages still higher. The commercial reports of the time record¹ "an increase in values," a volume of business in internal commerce, manufactures, agriculture, and in financial operations, and the extension of productive facilities and inauguration of new enterprises which exceed the figures of any previous year in the commercial history of the United States" and "in the scale of consumption an increase which has never been equalled." Along with this revival of "confidence" came naturally, and as a part of the program, an extension of credit facilities which inflated still further prices and wages and enhanced the boom.

¹ See Appleton's Annual for 1880.

THE COUNTRY SAVED.

The effect of the good times thus brought about by the financial classes was, as anticipated, the "death" for the time being "of the silver craze." A people suffering from a money famine are not partial to silver or to any other form of money or exchange medium. What they want is the machinery with which to perform exchanges; and if the bankers furnish this by depleting their reserves, taking out more circulation or lending and discounting more freely, the people in general are as well satisfied as tho United States notes had been printed or silver and gold coins had been struck. The danger of independent bimetalism on the part of the United States was thus avoided while at the same time the people were led to believe that resumption, the direct effects of which would have been to make times harder but for the special measures adopted by the financiers, had actually operated to make times good. Similarly, countries like France, Germany and Italy, that had built up their tariff fences, attributed their good times to protection, while England credited hers to free trade. But for *post hoc ergo propter hoc* where would statesmen be?

THE ELECTION OF 1880.

The contest between those who favored and those who opposed scarce money and an appreciating dollar was carried, of course, into the election of 1880; tho, as usual, this vital issue was kept in the background. Blaine, the popular idol of the Republican party, was again the candidate for the presidential nomination, and still favored the free coinage of silver and opposed the position of the financial classes. Other candidates for the same nomination were U. S. Grant and John Sherman. General Grant had already served two terms but was pressed by his friends to enter the race for the third term. His candidacy was entirely satisfactory to the financial classes; Senator Sherman's should also have been all that could be desired by those interests. He strengthened it, however, by proposing that congress demonetize the greenback. Of this the *Chicago Tribune* said:¹

Since the passage of the silver law Mr. Sherman has done everything to disparage silver; he has limited the coinage to the minimum; has refused to exercise the government's option to pay out silver in any considerable amounts; . . . and has by word and letter and act done all in his power to discourage the use of silver in the United States. . . . At the opening of the present congress he made the extraordinary recommendation that congress strike

from three hundred and fifty million dollars of the greenback currency of the country its legal-tender character. It was a high bid for the support of Wall street but a fatal one addressed to the producing and industrial classes of the country. . . . It is highly improbable that Mr. Sherman will receive an electoral vote from any state between the Alleghany and Rocky mountains upon the issues of abolition of silver money and demonetization of greenbacks.

President Hayes, who desired a second term, went still farther and advised congress to retire and destroy the greenbacks and supply their place with interest-bearing bonds. It was evident therefore that the financial classes were in this contest well supplied with presidential timber.

The struggle, especially in the important states of Pennsylvania, New York and Illinois, for the control of the delegations to the national convention, to be held in Chicago, was one of unusually intensity, the Wall Street element being determined to defeat Blaine at all hazards. In the convention the contest continued with even greater intensity. Blaine was at last overthrown only by the combination against him and in favor of the "dark horse," James A. Garfield, of all the anti-Blaine forces, tho this involved the burying of hatchets and the joining of hands of violent enemies. The platform was silent on the money question, save for the following oracular utterance: "The credit acquired [by the government] should never be impaired . . . reviving industries should be further promoted."

Mr Garfield's position on the financial question may be inferred from the following letter written him by Mr. Sherman on July 19, 1880:

"I hope congress will come together next winter in such temper that it may arrest the coinage of the silver dollar, if it will not change the ratio. This question, however, is a very delicate one to discuss in popular assemblies, and I propose, therefore, in my speeches to make only the faintest allusions to it, not surrendering, however, our views upon the subject, for upon this, I take it, we are entirely agreed."

The foregoing is strengthened by the following language from Mr. Garfield's letter of acceptance. Speaking of resumption he says it has "brought into use our store of gold and silver. The circulating medium is more abundant than ever before. The great prosperity which the country is now enjoying should not be endangered by any violent changes or doubtful financial experiments."

¹ Recollections of John Sherman, p. 779.

In the democratic party a similar contest was waged, with the greenback and silver elements favoring Seymour and the financial classes favoring Tilden. Tammany opposition, however, made the nomination of Tilden seem inadvisable and Mr. Tilden withdrew his candidacy two days before the meeting of the convention. General Hancock finally received the nomination on a platform the money plank of which was ambiguous. General Hancock was understood to be "unsound" on the financial question; and, tho this question was ignored in the campaign, this fact was sufficient to secure his defeat.



THE EVOLUTION OF EDUCATION.

BY THOS. E. WILL.

THE evolution of education is a fruitful theme. Evolution is growth, development, progress from the simple to the complex; from the crude to the elaborate; from the uniform to the unlike, the differentiated and specialized; from the imperfect to the more and more complete and perfect.

One might speak of the evolution of the buildings and appliances set apart for the aid of education, and sketch our progress from the old log school house to the modern splendid building devoted to the work of education; or he might trace the evolution of the teacher from the pedant of the Deserted Village or the Ichabod Crane to the modern teacher, equipped with the best that general culture and special training in psychology, pedagogics and educational history can furnish. Again one might speak of the development of educational methods from the crudities of the past, the confusing of the sign with the thing signified, of the means with the end, and the placing of the cart before the horse generally; to the methods employed by the equipped teacher of to-day, under whose master hand every fact, however trivial, pulsates with life, and every study, however dry, is transfigured like the faces of the apostles on the mount, and made radiant with the light of truth.

But upon these aspects of my subject I cannot dwell. I desire to speak of the evolution of education itself toward certain goals, and the first of these is democracy.

The past has been for the few. These are they for whom the earth and its fulness have been; it is these who have sat on thrones and worn purple and been glorified in song, and it is these of whom our history has been written. The many have tilled the soil, built the palaces, fought the battles, made the desert blossom and then been swallowed up in its bosom unknown and unwept. For these, in the past, education has been impossible; they have been the beasts of burden, propertyless, homeless, voteless, nameless. Schools, colleges and universities were for the great; and the education thus acquired has helped these to become great and enabled them the better to maintain their privileged position as the ruling class.

But the day of exclusive class culture is about past; the educational monopoly is broken: 1870 brought the free public school to England, while America has for a much longer time boasted of her little red or white schoolhouse on every hill top. This school is free. Tuition charges are abolished; books are furnished at a low cost or gratis; apparatus is for the free use of all; rich and poor here meet together on terms of equality unknown in polite society, the market, the street or the church. We speak sometimes of leveling tendencies. What equalizer approaches the public school! The son of the American nabob here takes his alphabetical place beside the gutter-snipe in rags and stands or falls as his own genius or application or the lack of them may determine. Of all places the one place in which each to-day finds his level is the public school.

Not content with erecting the school and providing the teacher and the appliances, we have gone farther and enacted compulsory laws requiring the child to attend the school. Nor do we stop at this. Distance and weather have in cases proved barriers too great to be successfully surmounted. Widely scattered and ungraded country schools have not been able to keep pace with accessible and highly organized city schools; those living in the country bearing a handicap from which those in the city were free. To meet these difficulties we shall in time consolidate districts, thus making possible graded schools in the country; and shall bring the pupils to school in public covered wagons, thus making school privileges available in the country as well as in the city, in foul weather as well as in fair, for girls as well as for boys and for small as well as for large.

I have spoken of the girls. I wish to speak of the enormous strides that have already been taken toward democracy in education

in respect to the education of women. Time was when practically the whole female half of the community, high or low, were shut out from the benefits of education. Women were supposed to be lacking in intellect and to have no need for education. In time, however, women and girls who wanted it and were able to pay for it were permitted to receive private tuition; later, seminaries were erected for their especial benefit; now the public schools are designed for girls as well as for boys, colleges and universities in the West are open to both sexes on equal terms, and even in the conservative East and in Europe the doors of the universities are slowly and grudgingly opening for the admission of women.

Nor are we ready to stop with the provision merely of *elementary* education for our children and youth. The higher education we are coming to feel is their birthright. That they may enjoy its privileges we have established in the generous West the state college and university, not for a class but for all. These, as much as the country and village schools, are the people's schools, built and maintained by all the people that the waters of the higher culture may reach the remotest boundaries of the commonwealth. As yet, however, in our higher educational institutions poverty is a far more real barrier than in country and village schools. Residence at a distance from home, more rigid requirements as to dress and living, tuition charges and fees which in cases still linger as relics of the system under which colleges were run not at the public expense for the public good, but at the expense of the individual student for private profit, all these operate as a property qualification to the higher education, barring with gold the gates that should be thrown wide open to all.

But the leaven of democracy is working. Our people will in time see that the commonwealth can no more afford to permit all but a handful of its youth to grow up uninfluenced by college and university education than they can afford to permit them to remain in ignorance of the three r's. They will realize that the state which permits the few to obtain a university education while debarring the many from its privileges makes not for but against equality and democracy; and out of the proceeds of their wealth, now overproduced, the people will make provision which will render tuition and other fees unnecessary and will establish fellowships and scholarships by the aid of which the poorest, if he but possess the wit and the will, can share equally with the rich in the benefits of a collegiate education.

Education, then, is steadily reaching out, ultimately to embrace all the people. Not only so, but it is also reaching out to embrace all truth. In the olden days the subjects of study in schools and colleges were few. The ordinary boy learned to read and write and cipher to the rule of three, and his education was completed. The collegian studied Latin, because, so far as he had learned, collegians always had studied it and there could be no higher education without it; he studied Greek for much the same reason and the additional one that the New Testament scriptures were written in a form of Greek; and if he would read in their purity those scriptures in which all truth was supposed to be locked up he must learn Greek. He studied Hebrew because the Old Testament was written in this tongue. He studied evidences of Christainity that he might be fortified against skepticism. He gave attention to mathematics, logic and rhetoric, chiefly that he might be prepared to think sharply and to use skilfully the weapons of dialectic against assailants of the faith once delivered. With these subjects and a very few others we have about completed the old-fashioned curriculum. Science was a thing practically unknown and unheard of; and when it did begin to assert its claims its advance was opposed, partly because it stood for an innovation, a departure from the good old ways, and partly because some who had studied it had weakened upon some of the dogmas of the church, and the suspicion had obtained that the truths of science negatived some of the truths of revelation, in which case as a matter of course the first set of supposed truths instead of being carefully compared with the second that each might correct the other, should be shunned as witchcraft, alchemy and other things believed to emanate from the prince of darkness.

So strenuous has been in the past the opposition to scientific study, on professedly religious grounds, that Huxley declared that upon no avenue of investigation could he travel far without finding erected squarely across his path an impassable barrier upon which was inscribed the legend "NO THOROFARE. MOSES."

Nor can we affirm that this cowardly position that some truth must be tabooed is even yet abandoned. True, men have insisted that astronomers and navigators be permitted to continue their discoveries, tho the earth be thereby found to be round and the scriptural statement that four mighty angels stood on the four corners of the earth be of necessity taken less literally than in the past; and they have insisted that the records of the rocks should be

read the doubts be thereby cast upon the records of Genesis. They have slowly made it possible for students to investigate the structure of plants, insects, animals and man, the striking analogies of form be discovered, and the conclusion has seemed to follow that the higher arose out of the lower and the good old doctrine of special creation was thereby proved a myth. In fact the doctrine of evolution in the biological sciences which a few years ago was the "black beast" of conservative thought has to-day conquered the scientific world, and the antagonist of evolution is ranked along with the antagonists of the doctrines that the earth moves and that blood circulates.

We are coming in fact slowly to realize, however, that all truth is of God, that each separate truth is but a part of the universal whole, that no truth can conflict with any other and that all truth is good and worthy of study and ultimately of benefit to man. By no one, perhaps, has this eminently wholesome conception of things been more strongly set forth than by Mr. Herbert Spencer, in the monumental work wherein he has endeavored to establish a vast and harmonious synthesis among all the sciences and all the departments of knowledge. When this view that all truth is one has fully established itself, the petty warfares between schools of thought and, especially, the childish and humiliating strife between religion and science will be at an end.

But while we may look forward to the time when every honest cultivator of the field of truth and every delver in the mine of knowledge will be respected and esteemed as a benefactor, that time is not yet fully come. But recently the writer visited a community where a few short months before a veritable intellectual panic had been created and a promising lecture course almost broken up by a calm, dispassionate and convincing lecture by a competent scientist on the subject of evolution. And while such a story may seem to us to-day like an echo from the past, it must not be forgotten that there are fields even now which the investigator may enter only at his peril, and college chairs around which continually plays the lightning of the wrath of offended individuals and class interests. I refer more particularly to the field of sociology with its sub-departments of economics and civics and to the chairs established for the cultivation of these sciences.

If it be indeed true (and who will deny the proposition?) that the evolution of education looks toward the conquest of the whole field of

knowable truth, it would seem superfluous to argue that those studies touching man most closely, treating of the methods and processes whereby we produce the utilities upon which and by which all must live, the exchange of those utilities against each other, their distribution among the various individuals and classes making up the society, and finally their consumption for the blessing or bane of man, should receive first attention in a community peopled not by disembodied spirits but by creatures of flesh and blood who must wear clothes, live in houses and eat three times per day. For such a people no questions can be more fundamental than the questions, What shall we eat, and what shall we drink, and wherewithal shall we be clothed?

Again, we are a people who pride ourselves upon our love of country, our loyalty to our institutions and our obedience to law. What would seem more rational, then, than that we should understand the constitution of our country, the political relations of individuals to each other and to their various governments, the methods by which our temporary rulers are sifted out from the multitude and lifted into seats of power, the machinery whereby our annual and biennial grist of legislation is ground out and the processes whereby the validity of these laws is tested and those that have stood the test are applied to the regulation and development of the state. Yet this study is the science of government or of politics; and there are not wanting those who tell us that the science of feeding, clothing and housing a people, that is the science of economics, and the science of governing them and administering their public affairs, that is the science of politics, should be stricken from the courses of study in our schools and colleges, while those who pursue them must take rank as "politicians," who by the same crude judgment are assumed to be necessary evils if not public enemies.

But science and the scientific method admit no permanent *terra incognita* in the field of knowable truth. While islands may remain for a time untouched and unexplored, the rising waves of science have marked them all for conquest; and one by one will dash over them from least and humblest even to greatest and most formidable.

And where the pioneer of science blazes the way the public teacher sooner or later must follow, for it is his function to supply the multitude with the spoils which the scientific investigator has prepared ready to his hand; the cry of "wolf," therefore, whether raised by the timid or by the interested, can no more frighten from

our schools the vital truths of economics and civics than it has been able to frighten away chemistry, once called the "black art," or geology or biology, more recently tabooed as the antagonists of holy writ and the enemies of God and man. When once the day has begun to dawn darkness must flee away and owls and bats must skulk to their hiding places.

Evolution, again, moves toward freedom of teaching. Tradition tells of the teacher, who, could he but secure the school, was willing to "teach the earth as round or flat" as his employers might dictate. And the parallel of this accommodating and pliable pedagog may still be found in schools and colleges in the person of the teacher who, mindful of continued salary and promotion, keeps his finger on the pulse of public opinion, conceals his views and blows hot or cold as safety and interest may seem to dictate. Whether just now we are really moving toward or away from freedom of utterance on scientific subjects may be a matter for question. In the biological fields, it is true, liberty has greatly increased within a decade or two; in theology the same is true in New England and in a few of our chief cities; but in the sociological, economic and financial fields we are in doubt whether the present movement is toward or away from freedom of teaching. When governing boards declare in terms that the professor must express not the results of his investigations and the conclusions reached by his unbiased judgment, but the "dominant sentiment of the community;" when they declare that the professor who dissents from this "dominant sentiment" will be "hauled up before the board" and compelled to "walk the plank" we may well feel the indignation voiced by Professor Foxwell, of Cambridge, England, when he exclaims:

It is difficult for us to understand the situation in the United States in regard to university professors.. The disclosures recently made as to the tyranny of the money power in the universities caused a great sensation here. . . . Our people cannot understand how you can sit down quietly under this poisoning of the springs of national life. There is no heritage we prize more highly, or guard more jealously, than English freedom of thought and speech. We tolerate at our universities any caprice, any eccentricity, even some degree of incompetency, rather than tamper with the liberty of professors. They are in fact absolutely independent. Like our judges they hold their chairs for life and good conduct.

I must honestly say that in the face of such proceedings as the censure of these professors by the moneyed interest, and one or two similar pieces of news which have reached me, I begin to think that your boasted freedom is something of an imposture. Such things could not be done in despotic Germany or Russia.

But despotism cannot permanently flourish on the soil of free America. With the growth of knowledge and the diffusion of light on other lines the people will learn that any science, so-called, which may not be freely pursued, is a farce and that any teaching that is done under dictation is unworthy and degrading; and then will come the demand, too strong to be resisted, that the gags be removed from the mouths of professors and teachers of economics and civics, and that instruction in lines of such vital moment become genuine and sincere.

Education, again, moves toward the development not of the intellect alone, as tho man were but a cerebrum, but of the whole man, head, hand, and heart. True education seeks not to destroy, but to maintain, the equilibrium among all the departments of man's complex nature; it looks, like the training of the Greek, towards symmetry and proportion. Education in the past, however, has been largely one-sided. At one time it crams the head with facts and rules, and threatens congestion of the brain; at another it runs to the other extreme, assumes that its object is to create gladiators and athletes, and turns out giants in physique who are pigmies in intellect, objects of pity and contempt. But neither the abnormal brain nor the abnormal biceps is desirable. If the time now spent in our eastern universities in developing mere muscle were spent in developing technical skill in the use of tools, and capacity to perform some useful work, the scorn with which the Latin diploma is now regarded by the practical business man might give place to admiration.

But our educational conceptions must rise to a still higher plane if our education is to become truly worthy. We have to do largely with the world of matter and physical forces, and our education, when it ceases to be scholastic, pedantic, and medieval, deals primarily with matter and physical forces. It is of the earth, earthy. It teaches us to handle things, make things, buy, sell, and get things; to apply gravity, steam and electricity to the production and handling of things; and to apply forces equally material to the handling and government of men. A new era is slowly unfolding before us. We shall learn that back of matter is spirit; that higher than head is heart; that more powerful than steam or electricity is sentiment; and that nobler and more blessed than getting are being and giving. Some day we shall learn that the dead fly in every precious vial of ointment, the gravity that drags men down, the poison that infects our politics, that makes our fashionable society at times a nest of ad-

ders, and that makes our system of wealth distribution a struggle as of swine about a trough, is selfishness. Our sociologists will discover that no economic or political reforms, no reorganization of social groups, no readjustments of economic machinery, no money systems sound or unsound, no tariffs, income taxes, public ownership, or referendums, alone can make a happy and prosperous society of a people on whom is the slime of the serpent of selfishness. We shall learn that selfishness pulls us apart and compels us to compete, each for himself, like the ignoble sailors on La Bourgogne, tho they thereby drown themselves and those whom they might have saved; while unselfishness draws us together, impels us to sink our individual interests, and to work for each other and the well-being of the whole, thereby cursing none but blessing all.

And when this great lesson is learned, our educational movement will take another forward and upward stride, and the efforts of teachers will be turned primarily, not toward training minds or hands, but toward filling the mind with noble ideals, firing the imagination with tales of heroism shown not in the spilling of blood and scaling of breastworks, but in the saving of lives, the sacrificing of self for the wellbeing of others, and the making of this world a fit habitation for men. And when this stage is reached in the evolution of education, we shall learn that the Prince of Teachers was not Pestalozzi nor Froebel, not Bacon nor Spencer, but he who without salary or school walked by Galilee and uttered the simple truths, too long hidden by dogmas and ceremonies, that to-day slowly yet surely are leavening and one day will save the world.



RÖENTGEN RADIOGRAPHY.

BY E. R. NICHOLS.

AT the close of the nineteenth century, one is justified in believing everything or nothing. Scientific progress has been so rapid and wonderful that nothing is too strange for belief. On the other hand, the newspapers and even some scientific journals are taking advantage of this condition and publishing accounts of wonderful discoveries that are going to revolutionize existing things—discoveries that began and ended in the fertile brain of some reporter. The great advancement in the generation and application of electricity in the past few years has made this a favorite field for the imagination. Any transformation of energy and perhaps even of matter is possible so long as no creation of energy or matter is assumed; and any reported discovery consistent with this statement is credible.

About three years ago, papers reported a new light generated by electricity and capable of penetrating all organic substances. The first mention of the X-rays in the scientific journals occurred about the middle of January, 1896. These reports, however, were very cautious, and mentioned the new light as a reported discovery. Professor Münsterburg of Harvard, in a letter to *Science*, January 31, 1896, written from Freiberg, Germany, says:

“It is well known that the discharges of a large Ruhmkorff induction coil produce in a vacuum tube, such as Crookes’s or Hittorf’s, colored rays which go in straight lines from the cathode to the glass of the tube. These cathode rays, which have been much studied, are visible to the eye and are well characterized by the fact that the magnet changes their direction; they do not pass thick cardboard, wood, etc. The place where these cathode rays reach the glass of the tube is the center of Röntgen’s X-rays. They are not visible and are not turned aside by a magnet; in short, they are not cathode rays, but are produced by them. If in a dark room we cover the tube by thin, black cardboard, nothing can be seen at all, even if we bring the eye in the direct neighborhood of the tube during the electric discharges. But if we now bring a card covered with barium platinocyanide near it the paper flashes up with every discharge, and this fluorescent effect is visible even if the paper is distant two meters [79 inches] from the tube, and it does not matter whether the varnished or the

other side of the paper is directed towards the tube. The X-rays thus go thru the black cardboard which is opaque to sunlight, and the same effect follows when a bound volume of a thousand printed pages is put between the tube and the fluorescent paper. We can measure the perviousness of the different substances to the new rays by the intensity of the light on the paper, comparing the effect with and without objects between the tube and the fluorescent surface. But there is also an objective way possible to study the perviousness, as the rays produce an effect upon photographic dry plates, which, of course, remains and allows us to control the subjective comparisons. Both methods show that wood is not much less pervious than paper; boards 3 cm. [1.2 inches] thick absorb very little. Hard rubber disks several centimeters thick do not stop the rays, and even aluminum plates 15 mm. [0.6 inch] thick do not make the fluorescence entirely disappear. Glass plates vary with the lead in them, those containing lead being less pervious. Platinum is slightly pervious, if the plate is not thicker than 0.2 mm., silver and copper can be a little thicker; lead plates 1.5 mm. thick are no longer pervious. All substances become less pervious with increasing thickness, a fact which is nicely demonstrated by photographs taken thru tinfoils of gradually increasing number. The perviousness of substances of equal thickness seems chiefly dependent on the density, but special experiments showed that different metals are not equally pervious if the product of thickness and density is equal; the perviousness of platinum 0.018 mm. thick and a density of 21.5 equals that of lead 0.05 mm. thick, density 11.3 and that of tin 0.1 mm. thick, density 7.1, and that of aluminum 3.5 mm. thick and a density of 2.6. Aluminum may thus be 200 times thicker than platinum, while its density is 0.1.

"The fluorescent effect of the new rays is not confined to barium platinocyanide, but it occurs also on glass, calc-spar, rock-salt, etc. Prisms and lenses do not diffract the rays, nor do prisms of hard rubber or aluminum. With regard to reflection and diffraction the following experiment is interesting. It is well known that pulverized substances do not let pass much light owing to refraction and reflection. Roentgen found with pulverized salt, calc-spar, zinc and other substances that the ray passes thru the powder with exactly the same intensity as thru the solid substance. Objects with rough surface let it pass exactly like polished ones. The shadow of a round stick is in the middle darker than at the edges; the shadow of a metal tube is in the middle lighter than at the edges.

"With regard to the effect on photographic plates, it must not be forgotten that lenses do not refract the rays and therefore ordinary photography is not possible; the pictures of the objects are only shadows. But these shadow-pictures can be taken in the closed wooden box of the camera in a light room, as the sunlight of course does not pass thru the wood, while the X-rays do. In this way Roentgen took photographs of a set of metal weights in a wooden box, and of a thick wire wound as a spiral around a wooden stick; the wood was pervious, the metal of that thickness not, and so the shadows of the weights and of the wire are seen in the photograph, those of the wood scarcely at all. In the same manner he took the picture of a compass needle in the closed box. The door between two rooms did not hinder the chemical effect.

"With regard to the nature of the X-rays it seems too early to say anything definite. Roentgen emphasizes the fact that they show no refraction and probably therefore move in all substances with equal velocity and are transmitted by a medium which exists everywhere and in which are the molecules of the substances. That is, they are ether rays, but not transverse ether waves like the visible or the ultra red or ultra violet invisible light; Roentgen supposes that they are longitudinal ether waves, the existence of which has for a long time been suspected by physicists. Researches regarding many other qualities of the new rays are in progress, and their results may clear up the theoretical interpretation."

In the same issue of *Science* the following occurs: "While Hertz and Lenard hold that the cathode rays are vibrations in the ether or even light of short wave length, Crookes and J. J. Thomson have urged that the rays are negatively charged matter traveling with great velocity. M. Perrin reported to the Paris Academy, on December 30, experiments which tend to show that the latter view is correct, and some relation will probably be found between cathode rays and the X-rays."

The above prediction is interesting, coming so early and yet pointing the way to the best explanation of X-rays.

Figure 1 is a vertical and horizontal view of a self-regulating X-ray tube. It consists of a spherical portion with arms nearly exhausted of air. The two portions of the figure are lettered to correspond. The electric current from a static machine or induction coil enters at B and passes to A by means of the platinum wire. It leaps from A to K and leaves at C. A current of high potential

passing thru a so-called vacuum tube drives the remaining air out and tends to reduce the vacuum to such a rare state that the current passes with difficulty. To keep the vacuum constant, some substance is placed in the bulb E that is volatilized by the current. When the vacuum becomes low, part of the current passes by the path B H F L D R to C. This volatilizes some of the substance in E which is in

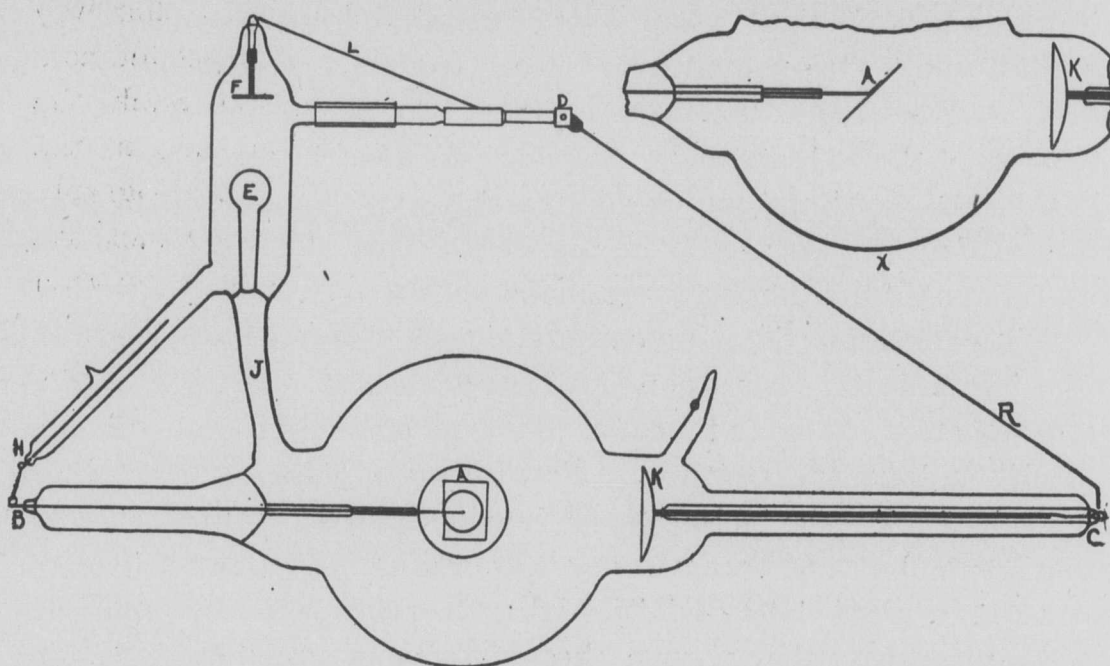


FIG. 1.

communication with the main bulb thru the chamber J. This permits all the current to again pass along the path B A K C. The air gap between R and C can be adjusted to any distance by swinging arm R on the axis at D. A is the anode and K the cathode. The anode is the rectangular piece of platinum hung obliquely as shown in the upper part of figure 1 at A.

The cathode is a spherical concave reflector with its focus at A. It would seem that the negatively charged matter leaves K with a high velocity and striking A is reflected downward to X. These are the cathode rays, visible, capable of being deflected by a magnet, and do not pass thru organic substance of any considerable thickness.

Outside of the bulb at X these cathode rays become X-rays, invisible, incapable of reflection or refraction and pass more or less readily thru all organic substance and some others. The best theory of these X-rays is probably the following from an article by J. J. Thomson in the *Philosophical Magazine* for February, 1898:

"A moving electrified particle is surrounded by a magnetic field, the lines of magnetic force being circles having the line of motion of

the particle for axis. If the particle be suddenly stopped, there will, in consequence of electromagnetic induction, be no instantaneous change in the magnetic field; the induction gives rise to a magnetic field, which for a moment compensates for that destroyed by the stopping of the particle. The new field thus introduced is not, however, in equilibrium, but moves off thru the dielectric as an electric pulse. In this paper we calculate the magnetic force and electric intensity carried by the pulse to any point in the dielectric.

"The distribution of magnetic force and electric intensity around the moving particle depends greatly on the velocity of the particle. If this velocity is so small that the square of its ratio to the velocity of light can be neglected, then the electric intensity is symmetrically distributed around the particle, and at a distance r from it is equal to $\frac{e}{r^2}$, where e is the charge on the particle; the lines of magnetic force are circles with the line of motion of the particle for axis; the magnitude of the magnetic force at a point P is $w \sin \frac{A}{r^2}$, where w is the velocity of the particle, and A the angle a radius from the particle to P makes with the direction of motion.

"When, however, the velocity of the particle is so great that we can no longer neglect the square of its ratio to the velocity of light, the distribution of electric intensity is no longer uniform; the electric intensity, along with the magnetic force, tends to concentrate in the equatorial plane, that is, the plane thru the center of the particle at right angles to its direction of motion; this tendency increases with the velocity of the particle until, when this is equal to the velocity of light, both the magnetic force and the electric intensity vanish at all parts of the field except the equatorial plane, and in this plane they are infinite.

"The pulses started by the stopping of the charged particle are, as might be expected, different when the ratio of the velocity of the particle to that of light is small, and when it is nearly unity. But even when the velocity is small, the pulse started by stopping the particle carries to an external point a disturbance in which the magnetic force is enormously greater than it was at the same point before the particle was stopped. The time the pulse takes to pass over a point P is, if the charged particle be spherical, equal to the time light takes to pass over a distance equal to the diameter of this sphere; the thickness of this pulse is excessively small compared with the wave-length of visible light. When the velocity of the

particle approaches that of light two pulses are started when it is stopped. One of these is a thin plane sheet whose thickness is equal to the diameter of the charged particle; this wave is propagated in the direction in which the particle was moving; there is no corresponding wave propagated backward: the other is a spherical pulse spreading outward in all directions, whose thickness is again equal to the diameter of the charged particle, and thus, if this particle is of molecular dimensions, or perhaps even smaller, very small compared with the wave-length of ordinary light. The theory I wish to put forward is that the Roentgen rays are these thin pulses of electric and magnetic disturbance which are started when the small negatively charged particles which constitute the cathode rays are stopped. . . .

"Thus we see that the stoppage of a charged particle will give rise to very thin pulses of intense magnetic force and electric intensity; when the velocity of the particle is small there will be one spherical pulse; when the velocity is nearly equal to that of light there will, in addition to the spherical pulse, be a plane one propagated only in the direction in which the particle was originally moving. It is these pulses which I believe constitute the Roentgen rays. As they consist of electric and magnetic disturbances, they might be expected to produce some effects analogous to those of light. If they were so thin that the time taken by them to pass over a molecule of a substance were small compared with the time of vibration of the molecule, there would be no refraction, and the thinness of the pulse would also account for the absence of diffraction.

"In the preceding investigation we have supposed that the stoppage of the particle is instantaneous; if the impact lasts for a finite time T the negative pulse will be broadened out, so that its thickness, instead of being $2a$,* will be $2a + VT$, where V is the velocity of light. The intensity of the magnetic force in the pulse will vary inversely as the thickness of the pulse, so that when the collision lasts for the time T , the magnetic force in the negative pulse will be
$$\frac{2a}{(2a + VT)}$$
 of the value given above. The more sudden the collision, the thinner the pulse and the greater the magnetic force and the energy in the pulse; the pulse will, however, possess the properties of the Roentgen rays until T is comparable to one of the times of vibration of a substance thru which it has to pass. In the case of the cathode rays

* $2a$ being the diameter of the electrified particle.

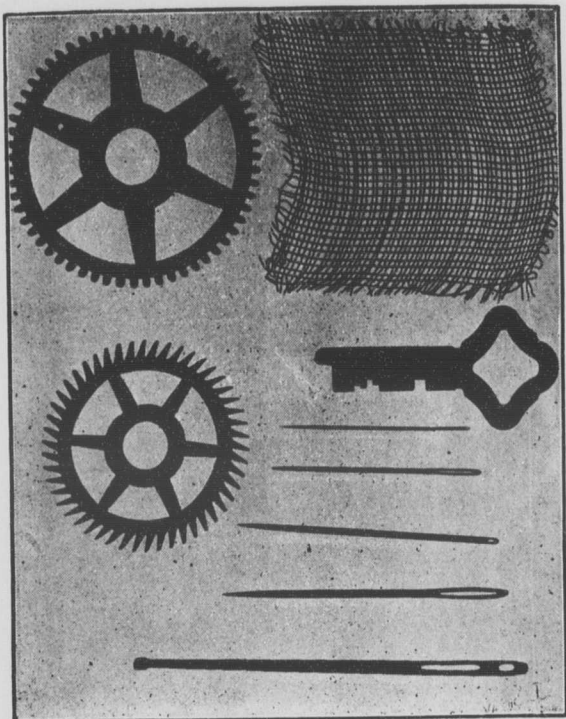


FIG. 2.

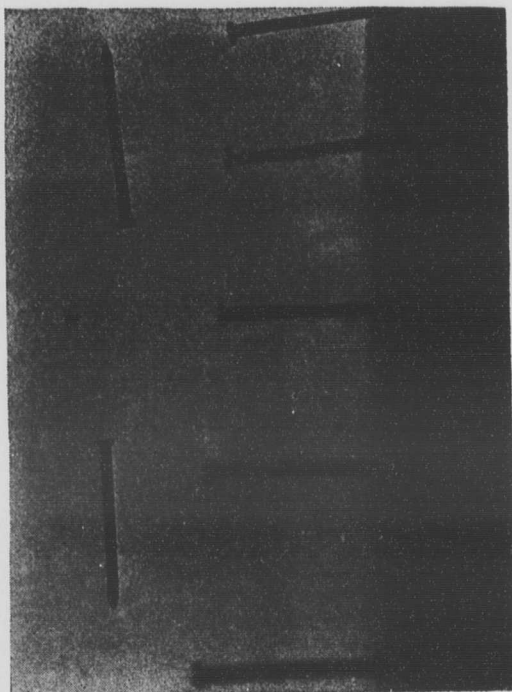


FIG. 3.

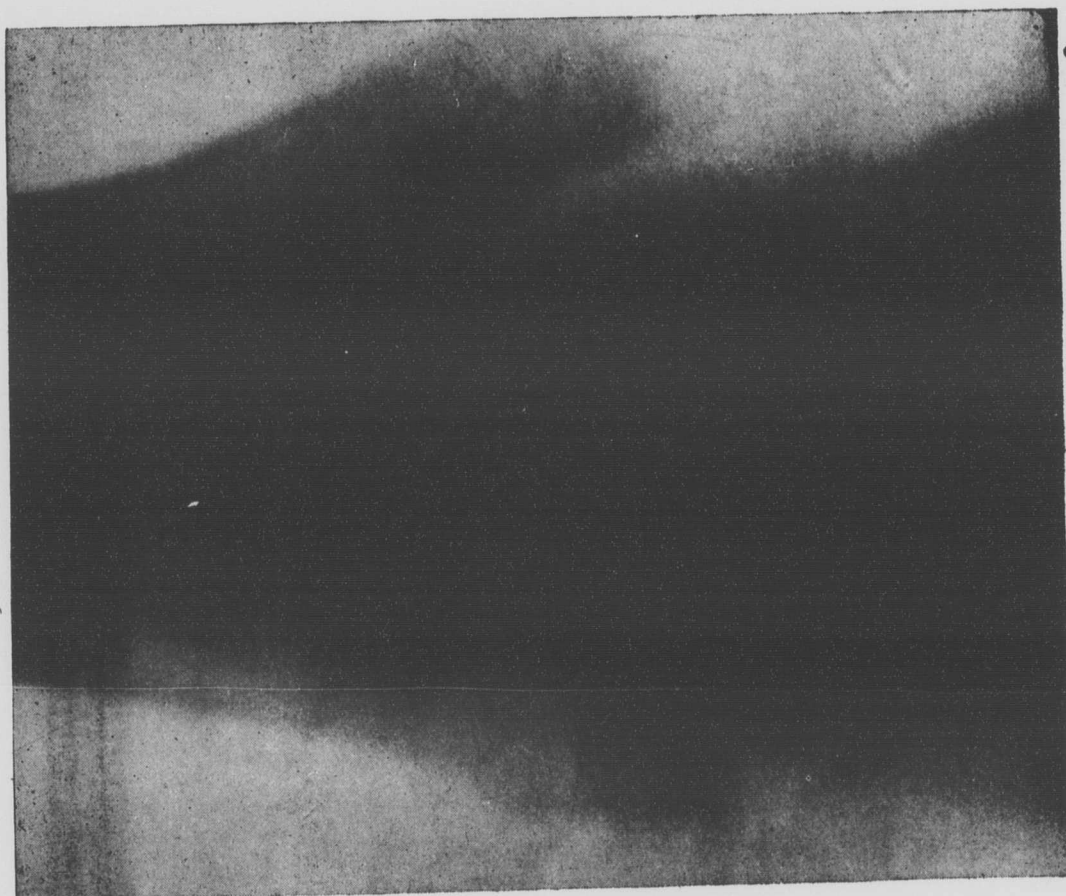


FIG. 4.

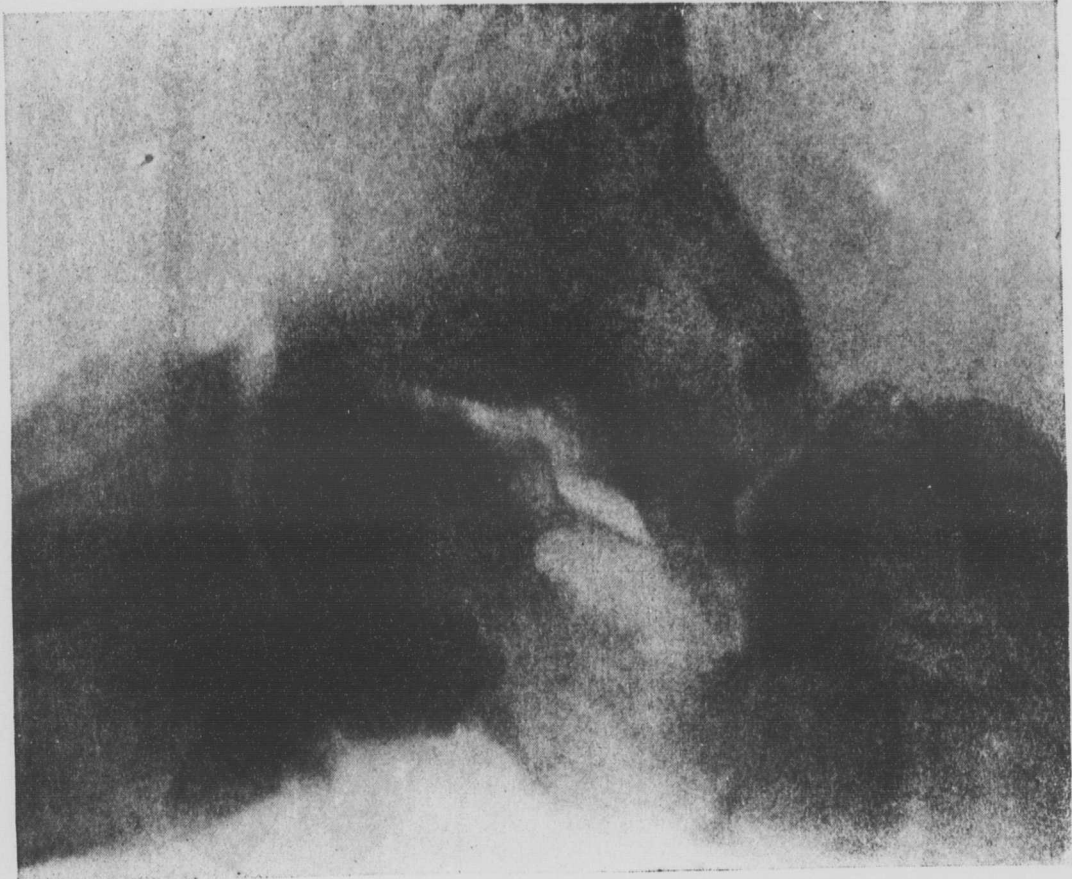


FIG. 5.



FIG. 6



FIG. 7.



FIG. 8.

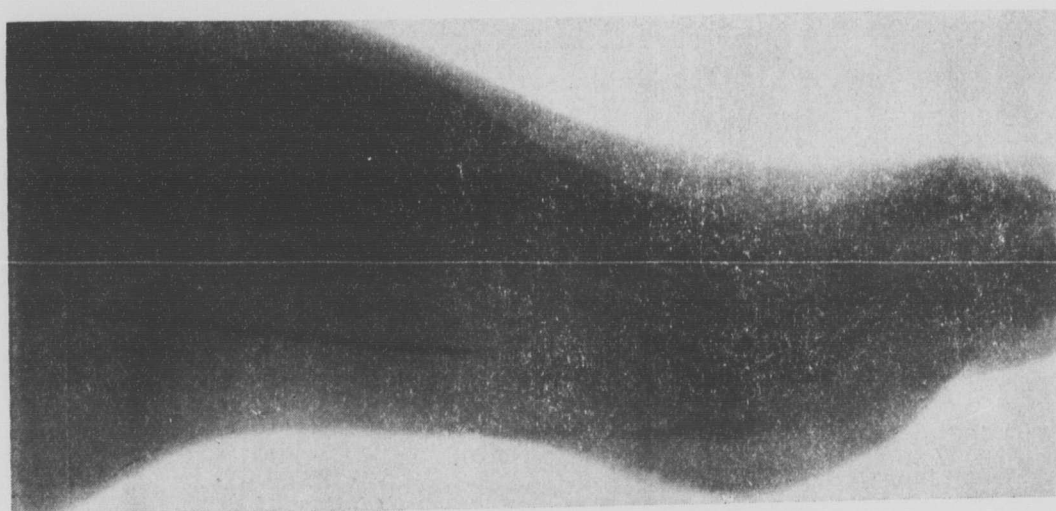


FIG. 9

all the circumstances seem favorable to a very sudden collision, as the mass of the moving particles is very small and their velocity exceedingly great. In some experiments which I described in the *Philosophical Magazine* for October, 1897, on cathode rays, the velocity of the negative particles was about one-third of that of light, and in some more recent experiments made on the Lenard rays, with the apparatus described by Des Coudres, considerably higher velocities were found. A change in the time of the collision will alter the thickness of the pulse and so change the nature of the ray."

Professors Failyer and Willard and the writer began experimenting with such apparatus as the College possessed in the spring of 1896, using a Toepler-Holtz static machine and various vacuum tubes, including incandescent lamps. After several failures we succeeded in getting some fair pictures of flat objects placed on the negatives. A focusing tube purchased in June enabled us to get good pictures of small objects such as the hand, snakes, frogs, etc. With the static machine (eighteen-inch, single revolving plate) and ordinary dry plates the action was slow, requiring from half an hour to one hour to get a good picture of the human hand. With an induction coil capable of giving an eight-inch spark and the self-regulating X-ray tube already described and X-ray dry plates, a picture of a human hand may be taken in from ten to fifteen seconds. The time must be considerably increased as the object to be radiographed increases in thickness, both on account of the greater thickness to be penetrated and the greater distance of the tube from the plate.

Figure 2 shows some small objects taken on a 4 by 5 plate and reduced to one-fourth area. These objects could be laid flat on the black, light-proof paper covering the negative and therefore give a sharp outline.

Figure 3 shows some of the difficulties of radiography. The objects were seven wire shingle nails about one inch long. Two of them were laid on the negative, the other five were driven into the edge of a half-inch pine strip. This strip with the nails was placed obliquely above the negative so that the nail at the right of the figure nearly touched the plate, the next was about one inch from the plate, thus bringing the nail at the left four inches from the plate. This indistinctness of objects at some distance from the negative can be partly overcome by placing the X-ray tube at considerable distance from the object. This however increases the time very much, and for living objects, especially if suffering from a fresh

wound, becomes impracticable. Before leaving figure 3, we might call attention to the shadow of the pine strip at the bottom of the picture.

The following illustrations show some of the practical applications of radiography that we have been making at the College. Figure 4 is a front view of a man's ankle showing a bullet just above the ankle joint. Figure 5 is a side view of the same. Several attempts had been made to find the bullet in the foot. A radiograph at the time of the accident would have saved much pain and expense. Figure 6 shows a bullet just below the elbow joint. Figure 7 is a side view of the same. Figures 8 and 9 are top and side views respectively of a girl's foot. This is a peculiar case. The girl at about twelve years of age hurt her foot while running barefoot. The foot swelled and was very painful for a time. The radiographs were taken about six years after the accident and neither the parents nor the girl were certain as to which foot was injured. The girl was suffering from nervousness and the doctor suggested the X-rays to determine whether or not anything had entered the foot at the time of the accident, with the result as shown. It seems strange that a needle 3 inches long could have been driven entirely into the foot, eye first, as is evident from the position of the needle as shown by the radiographs.

The possibilities of the X-rays have probably been overestimated, but they are certain to have a large use in detecting foreign substances in the body, such as metals, glass and calcareous deposits; and in determining the condition of the bones as to fracture or disease.



CONTRIBUTIONS TO THE KNOWLEDGE OF THE COCCIDÆ.

BY T. D. A. COCKERELL AND P. J. PARROTT.

(Concluded from last month.)

V. The species of *Lecanium* belonging to the group *Paralecanium*.

Paralecanium, Ckll., subg. nov., is proposed for the flat or flattish species, allied to *Calymnatus*, but having the marginal hairs modified into fan-shaped scales. Type *L. frenchii*, Maskell, N. Z. Trans., XXIII, 17.

Antennæ 8-segmented. (Australia, on *Banksia*) *frenchii*, Mask.
(Var. *macrozamiæ*, Fuller, on *Macrozamia*, is more elongated than the type.)

Antennæ 6-segmented (obscurely so in *expansum*) 1

1. Flat, broad, subtriangular, pointed in front. (Ceylon.)

. *planum*, Green

Like the last but smaller and lacking the dermal cells. (Cey-

lon.) *maritimum*, Green

Flattish, subcircular, median dorsal area with concentric se-

ries of polygonal depressed spaces. (Ceylon.) *geometricum*, Green

Oval, pointed in front; pale fulvous to castaneous, a submar-

ginal zone almost colorless. (Ceylon.) . . . *marginatum*, Green

Very large, flattish, longest diameter about 8 mm. (Ceylon.)

. *expansum*, Green

The above particulars are derived from the original descriptions.

The following data are from authentic specimens, the *L. frenchii* from Mr. Maskell, the others from Mr. Green.

Lecanium frenchii, Maskell. The scale remains opaque and very dark chestnut after prolonged boiling. There are two circular foramina at the cephalic end, in the position of the eyes; these are 265 micromillimeters from the margin, and 793 micromillimeters apart. Anal plates 150 micromillimeters long; anal cleft to tips of the plates, 348 micromillimeters. The three pairs of legs are practically alike, except that the anterior tibiæ and tarsi seem somewhat smaller. The measurements are: coxa, 91-104; femur with trochanter, 107-124; tibia, 76-83; tarsus with claw 76-99 micromillimeters.

Lecanium marginatum, Green. Scale after boiling brownish, but very pale. Marginal scales transversely oval, like a palm-leaf fan, overlapping, 35-45 micromillimeters broad. Stigmatic spines in threes; the middle one 50, the lateral ones 33 micromillimeters.

Anal plates 124 micromillimeters long; coxa, 66; femur with trochanter, 110; tibia, 66; tarsus with claw 83 micromillimeters.

Lecanium planum, Green. Scale after boiling remains a deep sepia brown, with numerous hyaline gland spots, especially at the sides. The margin is broadly hyaline, more or less striated with brown. Anal area hyaline; and plates about 140 micromillimeters long. The marginal fringe consists of broad, closely-set scales shaped like human incisors, and densely ciliate along their strait outer margins.

Lecanium maritimum, Green. Described (Ind. Mus. Notes, 1896) as a variety of *L. planum*, but evidently a very good species. Scale after boiling lighter colored than *planum* the two anterior foramina present as in *frenchii*, 497 micromillimeters apart. Anal plates 149 micromillimeters long. Marginal scales very pale, very broad, transversely oval, with rounded margins, overlapping, not ciliate. With a high power they are seen to be delicately radiately striate. Coxa, 90; femur with trochanter, 116; tibia, 66; tarsus with claw, 74 micromillimeters.

VI. *The species of Lecanium belonging to or resembling the subgenus Calymnatus.*

The following table includes some species, such as *L. strachani*, which really belong to no recognized subgenus, but are flat or flattish, and more or less resemble *Calymnatus*.

| | |
|--|--|
| Outline pyriform, marginal hairs branched. (Ceylon, West Indies)..... | <i>mangiferae</i> , Green, 1889 |
| Not so..... | 1 |
| 1. Scale green when alive..... | 2 |
| Scale brownish or grayish..... | 4 |
| 2. Scale about 6 mm. long, 3 wide and 3 high. (Mexico)..... | |
| ..... | <i>schini</i> , Licht. MS., Ckl., 1893* |
| Scale 2 to 3½ mm. long, oval..... | 3 |
| 3. Antennæ 7-segmented. (Ceylon, Brazil.)..... | <i>viride</i> , Green, 1896 |
| Antennæ 8-segmented. (Lagos.)..... | <i>viride</i> var. <i>africanum</i> , Newst., 1898 |
| 4. Scale distinctly tessellate..... | 5 |
| Scale not tessellate..... | 8 |
| 5. The tessellation microscopical, only seen after mounting.... | 6 |
| The tessellation large, the scale divided into plates easily seen with a lens..... | 7 |

*To facilitate the identification of *L. schini*, the following measurements were taken from part of the type material: *Antennæ*—(1) 47-56, (2) 62-67, (3) 90-101, (4) 47-87, (5) 47-56, (6) 47, (7) 31, (8) 56. *Legs*—coxa, 149-198; femur with trochanter, 265-298; tibia, 165-198; tarsus, 99-115; claw, 20-30.

6. Scale $6\frac{1}{2}$ mm. long, $3\frac{1}{4}$ broad, 1 high... (On *Cattleya* in hot-house, Ottawa.) *pseudhesperidum*, Ckll., 1895
 Scale not over $2\frac{1}{2}$ mm. long, and 1 broad. (On hothouse plants in England) *minimum*, Newst., 1892
7. Antennæ 7-segmented. (On hothouse palms in France)....
 *tessellatum*, Sign., 1873
 Antennæ 8-segmented. (On hothouse palms, Eng. and U. S.)
 *perforatum*, Newst., 1894

NOTE.—These two are apparently forms of one species; they are very flat and dark colored, $3\frac{1}{2}$ to 4 mm. long. The var. *swainsonæ*, Ckll., of *tessellatum*, is found in Jamaica on *lignum-vitæ*; it is larger, $4\frac{1}{2}$ to 5 mm. long, and the margin is not divided into so many plates.

8. Scale elongate, longer than oval, 4 to 5 mm. long, about 2 wide 9
 Scale oval 10
 Scale broad oval or almost circular 15
9. Very flat; antennæ 7-segmented. (On *Cyperus*)
 *angustatum*, Sign., 1873
 Fairly convex; antennæ 8-segmented { *longulum*, Dougl., 1887
 (On various plants in the tropics)
 *ficus*, Mask., 1898
 (On *Ficus*, China.)

NOTE.—*L. ficus* must be very near to *longulum*, but it is "darkish-brown;" while *longulum* is dark-grayish when alive, pale reddish-brown when dead and dry.

10. Scale not very small, about 4 mm. long 11
 Scale very small, not over 3 mm. long; rarely over $2\frac{1}{2}$ 13
11. Antennæ 8-segmented; mature scales with a waxy or cottony material scattered over the surface. (Brazil, on *Baccharis*) *baccharidis*, Ckll., 1895
 Antennæ 7-segmented; scale naked 12
12. Trochanter with a very long hair; tarsal digitules very long
 *hesperidum* (L.)
 Trochanter with a short hair; tarsal digitules short and stout
 *hesperidum* var *lauri* (Boisd.)
13. Antennæ 8-segmented; scale yellow; dorsal ridge marked by an irregular longitudinal series of polygonal cells, which are not visible in mounted specimens. (Japan, on *Pittosporum* and tea.) *notatum*, Mask., 1898
 Antennæ 7-segmented 14
14. Scale brownish-crimson or madder; skin crowded with gland spots; claw digitules very stout. (Jamaica.)
 *rubellum*, Ckll., 1894

dark gray or black. Placed in caustic soda, portions of the body give a purple or magenta substance into solution. The following measurements of *terminaliæ* (in micromillimeters) were taken from part of the type lot from Kingston, Jamaica: Antennal segments—(1) 34, (2) 36-39, (3) 56, (4) 59-62, (5) 20, (6) 14-20, (7) 34-50. Coxa, 99; femur with trochanter, 132-157; tibia, 99-105; tarsus, 68-74.

20. Symmetrical, or almost so. (Australia on *Melaleuca*.)
 *melaleuca*, Mask., 1898

Asymmetrical 21

21. Scale $3\frac{1}{2}$ mm. long, 3 broad; submarginal area with many large brownish glands, arranged more or less in radiating rows. (Brazil on mangrove.) *rhizophoræ*, Ckll., 1899

Scale $2\frac{1}{2}$ mm. long, $1\frac{1}{2}$ broad; marginal area with rather large hyaline spaces. (Mexico.) *impar*, Ckll., 1898

VII. A new *Eriococcus*.

Eriococcus larreæ, Parrott & Ckll., n. sp. Female 2.4 mm. long, 2 wide, 1 high, suboval, plump, practically naked, resting on a rather thick film of yellowish-white cottony secretion; segmentation conspicuous; color dark purple to dull black, the surface rather shiny, caudal area pale reddish, ventral surface of thorax dull red; legs and antennæ pale reddish fulvous. Some specimens have a median longitudinal row of three or four cream-colored spots on the anterior half of the back. Boiled in KHO, the females give a brilliant crimson color. Half-grown examples are flattish, often quite reddish, and frequently show a broken dorsal pale yellow stripe. Their dorsal bristles are comparatively few and very small, whereas *E. tinsleyi* of the same age is densely bristly. The microscopical characters of the adult females are as follows, all measurements in micromillimeters: *Antennæ*—segments (1) 43-47, (2) 25-31, (3) 50-59, (4) 62, (5) 20-29, (6) 20-28, (7) 34-36; formula, 4317256, varying to 43172(56). *Legs*—coxa, 149-166; femur with trochanter, 182-199; tibia, 90-116; tarsus, 130-149; claw, 33-36. *Spines*.—Several spines measured were as follows (micromillimeters): 8, 8, 14, 8, 14, 15, 16. The spines are not numerous, some individuals appearing nearly spineless. Taking the spiny (mainly lateral) areas, the distances between a number of spines, taken at random, were as follows, in micromillimeters: 47, 28, 70, 50, 47, 47, 19, 22, 39, 42, 33, 19, 36, 112, 42, 50, 16, 25, 56, 45, 70. *Hab.*—Underground on crowns of *Larrea tridentata*, behind the Agricultural College, Mesilla Valley, N. M., Jan. 23, 1899. (P. J. Parrott.) This insect, being naked, would go in *Rhizococcus*, but it is closely allied to *Eriococcus tinsleyi*, and we presume it will later form

a complete sac. It cannot very well be separated from *E. tinsleyi* by the antennæ or legs, but it differs greatly from that species in being much less bristly or spiny, and in having smaller spines. A number of spines of adult *E. tinsleyi*, taken at random, measured as follows in micromillimeters: 34, 31, 19, 30, 36, 28, 31. The distances between the spines of adult *E. tinsleyi*, measured in a number of cases, were as follows in micromillimeters; 42, 45, 28, 33, 49, 16, 33, 30, 18, 20, 17, 20, 20, 16, 22, 50, 60, 14, 18, 33, 49, 52, 16, 32, 48, 16, 30, 8, 16, 12, 8, 18, 20, 16.

VIII. The subgenus *Eulecanium* of *Lecanium*.

(All measurements of antennæ and legs are in micromillimeters.)

Lecanium quercitronis, Fitch.

- (a) Specimens on *Quercus* from Walnut Creek Cañon, near Flagstaff, Arizona, (E. M. Ehrhorn), have the antennæ thus: (2) 33, (3) 58, (4) 58, (5) 22, (6) 20, (7) 50; formula (34)7256.
- (b) Specimens on *Quercus undulata* from Arizona (Koebele, 1633; Div. Ent. 7925) are unusually globose, and the antennal segments measure: (1) 48-53, (2) 31-42, (3) 48-53, (4) 37-48, (5) 20, (6) 20-28, (7) 23-42. The formulæ observed are (13)742(56), (13)47265, and 3(14)2675.
- (c) Specimens on *Castanea pumila*, Mariposa county, California, (A. Craw) are $3\frac{1}{2}$ mm. long, $2\frac{1}{2}$ broad, 2 high. The newly-hatched larva is very pale pinkish, without marks. Antennal formulæ 31(74)256 or 31(742)(56).
- (d) Specimens on elm from Du Bois, Ills. (Chas. C. Adams), are $4\frac{1}{2}$ mm. long, $3\frac{1}{2}$ broad, $2\frac{1}{2}$ high, and are not so rounded as typical *quercitronis*. The antennal formula is 34(71)256, and the segments measure. (1) 39, (2) 34, (3) 59, (4) 46, (5) 25, (6) about 25, (7) about 40. The digitules are long, those of the claw unequal, one being thicker than the other.

Lecanium canadense, (Ckll.) On reëxamining the form from Orono, Maine, on elm (F. L. Harvey), we found 7-segmented antennæ, the segments measuring: (1) 42, (2) 32-39, (3) 62-98, (4) 54, (5) 20-22, (6) 20-22, (7) 40-47. The legs had the coxa 132, femur with trochanter 182, tibia 132. This form is hardly different from *quercitronis*, and while the scale is rather large and the third antennal segment quite long, the form on elm from Illinois, referred above to *quercitronis*, is a fair intermediate. In one antenna, 4 appeared to be only 19 micromillimeters, but this must be abnormal. It is possible that the Maine insect should be referred to *quercitronis*; or even that the Maine and Illinois elm forms should together form a new

species; but the only way to settle this will be by the examination of much larger series than we now possess, and the comparison of the immature stages. There is apparently still another elm *Eulecanium* in this country. A form found by Mr. W. Newell, at Ames, Iowa, on *Ulmus fulva*, is like *canadense* in the scale, but shorter, and proportionately higher. The antennæ are like those of *L. antennatum*, with a very long third segment; formula 327(45)6. Not enough of this species has been seen to determine the constancy of its characters.

Lecanium cynosbati, Fitch. What we refer to this species was found by Mr. G. B. King at Methuen, Mass., on *Gleditschia triacanthos*. The identification may be doubtful, as we find 7-segmented antennæ measuring: (1) 28, (2) 34, (3) 53, (4) 45, (5) 22-25, (6) 19-22, (7) 43. The 6-segmented form would have 3 and 4 of this antenna united. The coxa is 66, femur with trochanter 165, tibia 107, tarsus with claw 107-115. In having the third antennal segment distinctly longer than the fourth, this agrees with *caryarum*, *quercitronis*, etc., but it is distinguished from these by having 3 less than 65 micromillimeters, and at the same time 1 shorter than 2.

Lecanium caryarum, Ckll. Distinguished by having 7-segmented antennæ; with 3 distinctly longer than 4, and over 80 micromillimeters. In these particulars it agrees with some of the Maine *canadense*, but the femur and trochanter together are shorter than in the Maine species. These measurements are from the types: *Antennæ*—(1) 48-56, (2) 42-51, (3) 90-106, (4) 20-25, (5) 20-23, (6) 20-22, (7) 45-53. It will be seen that while 3 is very long, 4 is much shorter than in *quercitronis*. *Legs*—coxa, 83-99; femur with trochanter, 165; tibia, 115; tarsus with claw, 99.

Lecanium bituberculatum, Targ. MS., Sign. Our specimens were found on apple at Salem, Oregon. (C. A. Dailey, 1896.) They were sent by Mr. Cordley who at first stated, in error, that they were from plum. The antennæ measure—(1) 42, (2) 31, (3) 45-47, (4) 70-73, (5) 28-33, (6) 17-26, (7) 34-42. *Legs*—coxa, 87; femur with trochanter, 154; tibia, 112; tarsus, 78; claw, 23. This species is easily known by its scale, and the fourth antennal segment distinctly longer than 3. In the latter feature, and in having 4 over 60 micromillimeters, it agrees with *crawii*, *pubescens* and *armeniicum*.

Lecanium armeniacum, Craw. Our material is from prune trees at Mountain View, California (Ehrhorn). *Antennæ*—(1) 47, (2) 28, (3) 45, (4) 59-62, (5) 18-19, (6) 20, (7) 45. One antenna appeared to have only six segments, 6 measuring 42 micromillimeters. The legs were

not obtained in good condition, but the coxa is 90, the femur with trochanter 145 micromillimeters. This has a much larger coxa than *tarsale*. The third antennal segment is shorter than in *pubescens*.

Lecanium tarsale, Sign. Our material is from *Cornus alternifolia* at Andover, Mass. (King) The antennæ vary from 6 to 7 segments, measuring, 6-segmented—(1) 34, (2) 31, (3) 104, (4) 21, (5) 19, (6) 40; 7-segmented—(1) 28, (2) 39, (3) 48, (4) 56, (5) 20, (6) 19, (7) 30. Coxa, 47-49; femur with trochanter, 150-157; tibia, 90-92; tarsus with claw, 57-58. The 6-segmented form will be recognized by having a femur with trochanter over 140, combined with a coxa under 55, and a tarsus and claw under 65 micromillimeters. The 7-segmented form will be recognized by having 4 distinctly longer than 3, but less than 60 micromillimeters, while the coxa is hardly 50 micromillimeters. The tarsal digitules are very long. Scale 4 mm. long, $2\frac{1}{2}$ broad, 2 high, light brown.

Lecanium nigrofasciatum, Pergande. This is a very distinct little species, and hardly belongs to *Eulecanium*. The specimens measured are from Ruma, Ills., on plum, sent by Dr. S. A. Forbes. The species was described as new from these specimens some years ago, but the description was suppressed on learning that Mr. Pergande had the species in MS. Antennæ—(1) 15-31, (2) 42-45, (3) 90-98, (4) 17-20, (5) 16-21, (6) 40-47. Legs—coxa, 99-115; femur with trochanter, 149; tibia, 115; tarsus with claw, 82. Sometimes the antennæ appear to be 7-segmented, with a formula 4273156. This species was also received from Mr. G. B. King, found on *Acer rubrum* at Methuen, Mass. Apart from the scale characters, and the transparent derm after boiling, this species will be known by the 6-segmented antennæ, with the femur with trochanter over 140 micromillimeters, coxa over 75 micromillimeters, tarsus with claw under 85 micromillimeters, and tibia over 110 micromillimeters.

Lecanium ribis, Fitch. In *Canad. Entom.*, 1895, p. 255, are some notes on a species presumed to be Fitch's *ribis*. Mr. Pergande, we understand, doubts this identification; but we are not yet informed precisely on what grounds. Fitch's description is quite inadequate, and it may be impossible to say with certainty what he had before him, unless his types can be examined. Even so there may be doubt, as Fitch certainly sent to Signoret as *caryæ* a scale very different from the original insect of that name, and it may well be that other species in his collection were confounded. The following measurements are from the form found on mulberry in Ohio by Professor

Webster: *Antennæ* (1) 42, (2) 32, (3) 99, (4) 18, (5) 15, (6) 33. *Legs*—coxa, 99-115; femur with trochanter, 145-149; tibia 99; tarsus, 54; claw 20. This insect, whatever it is, may be known by the small scale, and 6-segmented antennæ, with the femur and trochanter over 140 micromillimeters (this separates it from *pallidior* and *kingii*,) coxa over 75 micromillimeters (this separates it from *tarsale*,) tarsus and claw under 85 micromillimeters and tibia not over 100 micromillimeters.

Lecanium quercifex, Fitch. What we regard as a variety of this species was found by Mr. G. B. King at Methuen, Mass., on an ornamental shrub. It is smaller than the form described by Signoret, being only 5 mm. long, 3 broad, $2\frac{1}{2}$ high. The antennæ seem variable; sometimes they appear 7-segmented, and exactly as Signoret describes for *quercifex*. *Antennæ*—(1) 28, (2) 34, (3) 92, (4) 43, (5) 29, (6) 33. *Legs*—coxa, 82; femur with trochanter, 165; tibia, 115; tarsus with claw, 90. This may be recognized among forms with 6 antennal segments by having the femur and trochanter over 140 micromillimeters, coxa over 75 micromillimeters, tarsus and claw over 85 micromillimeters, and tibia over 110 micromillimeters.

Lecanium kingii, Ckll. *Antennæ*—(1) 26-28, (2) 32-34, (3) 89-93, (4) 23, (5) 20-22, (6) 39-42. *Legs*—coxa, 66; femur with trochanter, 115; tibia, 99; tarsus with claw, 83. These measurements are from the type slide. The species will be known by the 6-segmented antennæ, with the femur and trochanter less than 120 micromillimeters, and tarsus and claw over 80 micromillimeters. By the antennæ and legs, it falls close to *pallidior*, but the scales of the two are very different.

Lecanium variegatum, Goethe. The measurements are from material found on plum and sent from Germany by Mr. Goethe. Unfortunately no perfect antenna was found, but the first four segments measure: (1) 42, (2) 33, (3) 47, (4) 56. *Legs*—coxa, 90-108; femur with trochanter, 157-165; tibia, 107-112; tarsus, 88-90; claw 28-32. This resembles *L. armeniacum* in having the fourth antennal segment distinctly longer than 3, but less than 60 micromillimeters, and the coxa 90 micromillimeters or over. It differs at once from *armeniacum* in the scale. Mr. Goethe says that the gay coloration of the scales lasts only for a short time, and soon gives place to a coffee-brown tint. He adds that Lichtenstein wrote him that he thought the species was identical with *L. vagabundum*, Förster. This, however, is hardly likely.

Lecanium fitchii, Sign. The material measured is from Medina county, Ohio, on wild blackberry. (Webster.) *Antennæ*—(1) 39-47, (2) 36-42, (3) 42-64, (4) 53-64, (5) 17-21, (6) 17-22, (7) 39-42. *Legs*—coxa, 102-115; femur with trochanter, 132-165; tibia 99; tarsus with claw, 100-103; (tarsus, 82-86; claw, 17.) This differs from *L. armeniacum* by the longer coxa, but the antennæ are practically the same.

Lecanium perornatum, Ckll. & Parrott, n. sp. Female scale nearly globular, 4 mm. long, $3\frac{1}{2}$ wide, $3\frac{1}{2}$ high, smooth but only moderately shiny, transversely banded with alternate bands of yellow and dark brown, the bands of about equal width, but narrower and less distinct on the hind part of the scale. There are three of the brown bands especially large and conspicuous, and also a longitudinal median dorsal brown stripe. These markings are fully retained in the dead and dry scales, after producing young. *Antennæ* 7-segmented—(1) 50-56, (2) 47, (3) 31-47, (4) 16-25, (5) 22-28, (6) 16-22, (7) 22-39. One antenna appeared to be only 6-segmented, 6 being 33 micromillimeters. In this 2 and 3 were of the same length, 47 micromillimeters. A noticeable feature is the short 4. *Legs*—coxa, 49; femur with trochanter, 115; tibia, 94; tarsus with claw, 66. *Hab.*—Moravia, Austria, June 26, 1897, on stems of *Rosa canina*; sent by K. L. Kafka, as *L. rosarum*. It differs entirely too much from the descriptions of *L. rosarum* to be that species, and it does not agree with anything else; so, as it is a very pretty species, we call it *perornatum*.

Lecanium macluratum, Ckll. The following measurements are from the type lot: *Antennæ*—(1) 42-62, (2) 31-33, (3) 101-112, (4) 14-19, (5) 16-17, (6) 19, (7) 28-33; formula 31(27)(64)5. *Legs*—coxa, 99-115; femur with trochanter, 133-157; tibia, 104-115; tarsus 83-90; claw, 20. In having 7-segmented antennæ, with 3 distinctly longer than 4, and over 80 micromillimeters, and the trochanter plus femur, less than 170 micromillimeters, this falls with *caryarum*. It differs from *caryarum* in its smaller scale and shorter antennæ.

Lecanium magnoliarum, Ckll. The following measurements are from topotypes: *Antennæ*—(1) 70, (2) 47, (3) 94, (4) 76, (5) 45, (6) 62, (7) 33, (8) 47. *Legs*—coxa, 132; femur with trochanter 231; tibia, 198; tarsus, 115; claw, 33. In April, 1898, Mr. Ehrhorn sent some immature specimens on Japanese *Magnolia* and *Daphne*, and adults on Virginia creeper, all from San Jose, California. The immature scales have much the shape of *L. hesperidum*, but are longer, and there is a well-marked longitudinal keel. In color they are light lemon yellow, marbled with black or blackish, in a subreticulate pattern.

GENERAL REMARKS. It is not thought advisable to give a synoptical table of *Eulecanium* until the species are better known. The antennæ, when 6-segmented, are very uniform, with a long 3; but the 7-segmented antennæ separate into two groups, one with 3 longer than 4 (as *maclurarum*, *caryarum*, *cynosbati*, etc.), the other with 4 longer than 3 (as *tarsale*, *armeniaceum*, *crawii*, *bituberculatum* and *pubescens*). Sometimes 3 and 4 are about equal (some *fletcheri* and *quercitrionis*). Unfortunately there is a constant tendency for the 6-segmented antennæ to vary to 7-segments, or vice versa. It is probable that no species has indiscriminately 6 or 7 segments, but it requires a larger series of most than we have yet examined, to determine which is the normal type. The species with 8-segmented antennæ are comparatively few (e. g. *magnoliarum*, *douglasi*, *berberidis*) and easily determined, except when a normally 7-segmented form varies to 8, as may occasionally happen. Valuable characters are found in the color and appearance of the subadult females (as in *juglandis* and *rubi*), and in the color and markings of the newly-hatched larvæ, but these characters are as yet known in only a few species.



A PERSPECTIVOGRAPH.

BY ARNOLD EMCH.

PANTOGRAPHS are instruments by which figures may be drawn similar to given figures. They consist of linkages whose geometrical principle is based upon the similarity of figures. As a special case every pantograph can produce a figure equal to a given figure. Thus, the pantograph is the mechanical contrivance whose functions correspond to the geometry of similar and equal plane figures. The question naturally rises whether it is not possible to invent an apparatus which produces a perspective figure of a given plane figure. Provided this can be done, the problem will then practically be solved to produce collineations in a plane by the movement of a machine.

2. The following lines contain a short theory and description of a mechanism by which a perspective of any plane figure may be drawn, and which, consequently, may be called a *perspectivograph*.

The geometrical principle of this mechanism is expressed by a theorem which the author has proved in No. 5, vol. XI of the *Annals of Mathematics*.* It may be stated as follows:

Two conics K and K' in a plane, tangent to the same straight line L , determine a projective transformation. To find the corresponding point to a point P , draw from P the two tangents to the conic K , and from the points where they intersect the line l two tangents to the conic K' . Where these intersect each other is the required point P' . The two conics K and K' may be considered as the intersections of two osculating planes with the developable surface of a curve of the 3d order in space.

From this point of view the projectivity of the points P and P' is immediately apparent.

As a special case the corollary is obtained:

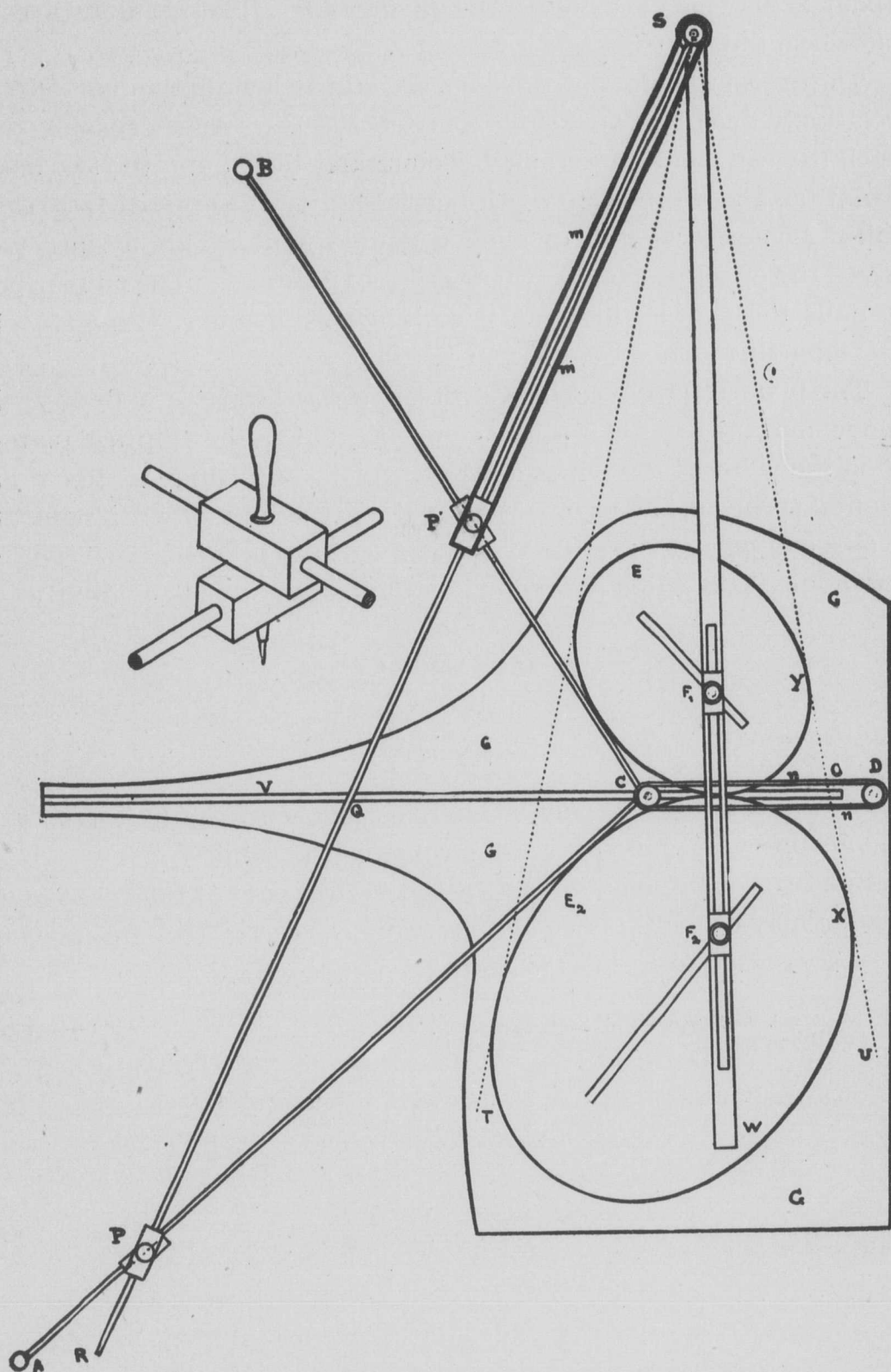
Any two conics tangent to each other determine a perspective collineation with the common tangent at their point of tangency as the axis and the point of intersection of the other two common tangents as the center of collineation.

3. From this fact it is easy to explain the construction and working of the perspectivograph as it is illustrated in the accompanying figure. It consists of five principal parts:

- (1) A frame G which carries the other parts.
- (2) Two elliptical plates E_1 E_2 .
- (3) A rod SW to fix the perspective center S .
- (4) A linkage composed of the bars SR , AC and BC .
- (5) Two rubber bands m and n which keep the bars AC and BC in every position tangent to the ellipses E_1 and E_2 .

Connected with the frame G are the slide V in which the joint C of the bars AC and BC is compelled to move and a fixed screw D to which the rubber band n is attached. The tendency of n is to move the point C towards D . The two elliptical plates E_1 and E_2 must be made tangent to each other, so that the common tangent at their point of tangency coincides with the axis of the slide V . By means of the clamp screws F_1 and F_2 the elliptical plates and the rod SW may be clamped to the frame G . Rectangular openings in the plates and the rod make it possible to change the mutual position of the plates according to the desired ratio of the perspective. The joint S must always be placed at the point of intersection of the two tan-

*On the Congruences of Rays (3, 1) and (1, 3). See also a number of articles on this subject by Prof. H. B. Newson in the *Kansas University Quarterly*.



gents T and V common to both ellipses. To find the correct position of S, these tangents may be drawn by a ruler; or two rulers turning about S may be attached to the pivot at S. These rulers are not shown in the figure.

The crossing points of the bars AC and BC with the bar SR are relatively fixed by two double joints P and P'. At a crossing point each bar can slide thru a small rectangular block, and the two blocks can turn about the same vertical axis, as it will appear from a detailed isometric sketch of such a double joint. This arrangement gives the crossing points two degrees of freedom. The rubber band *m* pulls the joint P' towards S and, in this manner, keeps the bar BC tangent to the ellipse E₁.

The point P now describes a given plane figure. If during this movement the bar AC is always kept tangent to the elliptical plate E₁, then the point P' describes a figure which, according to the fundamental theorem, is a perspective of the given figure with regard to S as a center and the slide V as an axis of the perspective. The anharmonic ratio which characterizes the perspective is evidently

$$\Delta = (S \ QPP') = \frac{SP}{SP'} : \frac{QP}{QP'}$$

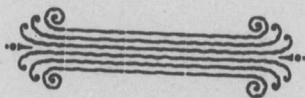
or also

$$\Delta = \frac{SX}{SY} : \frac{OX}{OY}$$

The perspectivograph may be modified in a number of ways, altho the geometrical principle always remains the same.

For further information on the theoretical part of this subject the reader may consult *Cremona's Projective Geometry* and the author's *Perspective Collineation in the Plane*.*

*No. 1, vol. v of Kansas University Quarterly.



CIVICS ANALYSES.

MADE UNDER THE DIRECTION OF PROFESSOR PARSONS.

[This matter appears in its present form for the convenience of the Civics Department; capitals being used in some cases for emphasis, abbreviations and ditto marks for rapidity and condensation, and indention for analytic effect.]

Kansas III. Cities.

THERE are three classes of cities in Kansas:

1st cl.=cities over 15,000 population.

2d cl.= " " 2000 and not exceeding 15,000.

3d cl.= " " 250 " " " 2000.

The executive power is in the hands of the Mayor.

The legislative power is vested in the Mayor and Council.

The judicial power is in the Police Courts and Justices of the Peace.

TABLE OF OFFICERS.

| | 1ST CL. CITIES. | 2D CL. CITIES. | 3D CL. CITIES. |
|-----------------------------------|---|--|--|
| Wards..... | 4 to 6 | At least 4 if pop. exceeds 4000. Not more than 4 unless pop. exceeds 8000. | No division into wards. |
| Councilmen..... | { 2 from each ward holding 2 years. 1 elected each year. | Same as 1st class..... | { 5 councilmen elected at large to hold one year. |
| Mayor | Elected for 2 years..... | Same as 1st class..... | Elected for 1 year. |
| City Clerk..... | " " 2 years..... | Elected for 1 year..... | " " 1 year. |
| City Treasurer... | " " 2 years..... | " " 2 years..... | { App't'd by Mayor with consent of Council. |
| City Attorney.... | " " 2 years..... | " " 1 year..... | " " " " |
| City Assessor..... | { App't'd by Mayor with consent of Council.... | " " 1 year..... | " " " " |
| City Engineer.... | " " " " | App't'd by Mayor with consent of Council. | ..... |
| Street Comss'r... | " " " " | Elected for 1 year..... | Elected for 1 year. |
| Fire and Police Comss'rs (3)..... | { Elected (for 3 yrs.) in cities over 40,000..... | ..... | ..... |
| Police Judge..... | { Elected (for 2 yrs.) or appt'd by Police Comrs | Elected for 2 years. .. | Elected for 1 year. |
| City Marshal..... | { App't'd by Mayor and C. or by Police Comssrs. | " " 1 year..... | " " 1 year. |
| Assistant " | " " " " | App't'd by Mayor with consent of Council. | { App't'd by Mayor with consent of Council. |
| Policemen | " " " " | " " " " | " " " " |
| Fire Marshal..... | " " " " | " " " " | " " " " |
| Constables* | Elected for 2 years..... | Elected for 2 years. | *Elected for 2 years. |
| Justices of Peace* | " " 2 years..... | " " 2 years..... | * " " 2 years. |
| Board of Education..... | { If there are 4 wards, 3 members are elected from each ward (one each yr.) to hold 3 yrs. If there are more than 4 wards, 2 members are elected from each ward (one each year) to hold 2 years. If the city has 35,000 pop. or over, the Bd. of Ed. consists of 6 members elected at large (two each yr.) to hold 3 yrs. | { In cities of the 2d class under 10,000 the Bd. of Ed. has two members from each ward (one elected each yr.) holding 2 years. In cities of 2d cl. over 10,000 pop. the Board consists of 6 members elected at large (two each year) to hold 3 years. | { For school purposes the third class city is a school district. |

*The constitution requires the election of 2 or more justices of the peace in each township to hold for a 2-year term. By statute each city of the 1st and 2d classes constitutes a separate township for the purpose of electing justices of the peace and constables to be chosen at the regular city elections. (§ 48 ch. 110 Gen. Stats. 1868. Ward v. Clark, 35 Kas. 315, 317, 1886.) Any

THE MAYOR.

The Mayor is the chief executive officer of a city. His powers and duties in a city of the 1st class include all that are stated in the following provisions except the 7th. In cities of the 2d and 3d classes, the powers and duties of the Mayor include all the following provisions except those in italics.

POWERS AND DUTIES OF THE MAYOR.

1. To preside at meetings of the council. (The council may elect one of its number to be President of Council to preside when the Mayor is absent.)
2. General superintendence of city officers and affairs. The Mayor may at any time require any officer to exhibit his accounts.
3. To see that the city ordinances are complied with, and to preserve the peace. He may call on all male inhabitants over 18 and under 50 to aid in enforcing the laws and ordinances. *May appoint special police to act till the next meeting of council. May call on the militia to keep order and enforce ordinances.*
4. To communicate to the council, from time to time, information concerning the finances, police, health, security, ornamentation, comfort and general prosperity of the city, and recommend measures he deems advisable.
5. To veto ordinances and contracts of which he disapproves. (Council may pass them over his veto by a three-fourth vote.)
6. To sign ordinances and contracts he approves, also commissions of officers, etc.
7. To sign all orders or drafts on the city treasurer.
8. May with consent of council, remit fines and penalties, and grant pardons for offenses against city ordinances.

3d class city having more than 1000 population and an assessed value, real and personal, of \$150,000 or more "shall also constitute a separate township, for all township purposes, and for the election of 2 justices of the peace and 2 constables" to be elected at the regular city elections. (Gen. Stats. 1897, p. 450.) Cities of the 3d class below the grade named form a *part* of the township they happen to be in, and have a *share* in electing the township justices and constables not at the city elections but at the general elections in the fall. Altho the justices in the 1st and 2d class cities and one division of 3d class cities, are chosen at the regular city elections, they are not strictly city officers, but rather township and county officers, being chosen by townships under the constitution and having a jurisdiction coextensive with their respective counties. For this reason a statute giving women the right to vote for city officers does not give them a vote upon justices of the peace. (State v. Parry, 52 Kas. 1, 8. 1893.)

In cities of the 1st class the Mayor (with consent of council) appoints a market-master, weigh-master, inspector of grain, etc. Such officers may be appointed in cities below the 1st grade if deemed necessary. But in small places it is possible to combine the duties of several officers; for example, the city clerk may act as weigh-master.

In cities of 40,000 or more population the Mayor and council shall appoint a city counselor in addition to the city attorney.

In cities over 30,000 pop. the Gov. shall appoint a Commissioner of Elections to hold for 4 years. He attends to the registration of voters, publication of precincts, etc.

The old law made every incorporated city above 600 inhabitants a separate road district under the same rule as the township road districts, viz, that every male person between 21 and 45 resident 30 days in the state and capable of working on the roads must do so for 2 days of 8 hours each, or furnish a substitute, or pay the road overseer (or street commissioner) \$1.50 for each day. According to Gen. Stats. 1897, vol. 1, pp. 357, 447, the Mayor and council in 1st class cities under 20,000 population may require 2 days work of 10 hours each or \$3, and in cities of the 2d class over 10,000 the Mayor and council may require 2 days work of 10 hours each or \$2 in lieu thereof. This seems curious not only as breaking in upon the clear uniform rule of the old law, but because of its inconsistency with the principle that 8 hours shall constitute a day's labor in all public employments which is set forth in the same volume of laws, p. 781.

(There are other remarkable things in this revision of the laws, for example, in vol. 1 we are told on p. 341 that the city clerk, city treasurer, and city attorney, in cities of the 1st class, are elected, but on turning to p. 343 we discover that these officers in cities of the 1st class are appointed by the Mayor and council. The fact is that these offices were formerly appointive in the said cities but are now elective. The two laws have both been put in the Gen. Stats. of 1897 without anything to show which is in force at the present time. See also vol. 1, p. 453 where two paragraphs (§31) relating to the election of justices of the peace in 1st and 2d class cities are inserted in the chapter on 3d class cities with which they have nothing to do, and omitted from the chapter on 1st class cities which is thereby rendered incomplete and misleading. Many other cases of confusion and inaccuracy could be cited but these may be sufficient to show that the revision needs revision. No one, however, can fully realize the seriousness of Webb's Complication of the Laws until he tries to build a brief with their aid and hunts the index to locate the statutes that bear upon his points.)

POWERS AND DUTIES OF CITIES.

A. *Under sweeping laws applying to all classes of cities at a stroke.*

The Mayor and Council of any city have power—

1. To grant local franchises to gas, electric light or power, heat or water companies and collect rentals from them for the use of the streets, franchises not to exceed 20 years and to be terminable after 10 years.
2. To regulate such companies, fix their charges, and contract with them for service.
3. To build or buy, own and operate gas works, electric light or power plants, heating plants, or water works, and supply the city and its citizens with water, light, gas, power or heat for domestic and all other purposes. (Laws of 1897.)
4. To apply to the county commissioners to lay off cemetery grounds or additions thereto.
5. To change the frontage of lots.
6. To pay damages for injury to property, life or limb, by mobs within the city limits.
7. To establish public libraries upon a referendum vote to that effect initiated by a petition of 50 taxpayers.
8. To consolidate two adjacent cities into one by joint ordinance passed in joint session of the mayors and councils of the two cities, two-thirds of the councilmen of each city voting in the affirmative.
9. To subscribe for stock of companies organized for mining or boring for coal or natural gas, or boring artesian wells, but a majority vote of the council and of the citizens at the polls is necessary, and the subscription to any one company must not exceed \$3000 in 3d class cities, \$5000 in 2d class cities and \$10,000 in 1st class cities.
10. To levy taxes, borrow money and issue bonds under conditions prescribed in the statutes, (generally including the referendum when a bond issue is in question) and subject to the limits placed by the legislature upon city taxation and indebtedness.

Many other functions are common to cities of all classes, e. g. the election of officers, preservation of order, safety and health, prevention of fire, administration of justice, establishment and management of schools, opening improving and caring for streets, regulating various occupations, granting franchises and performing various services. But these depend, for their legislative authorization, upon special enactments and the separate charter acts, one for each class of cities, instead of being conferred on all classes at once by a single sweeping law. A number of the subjects above tabulated from the broad laws are also dealt with in the class statutes.

The administration of justice is in the hands of the courts. The building of school houses and management of the whole school system is in the hands of the school boards. The rest of the functions with which we are dealing are exercised by the Mayor and Council with the occasional help of the referendum.

B. The Functions of Mayor and Council in 1st class Cities.

(Cities over 15,000 population.)

1. The care and management of the city, its property and finances.
2. To enact, alter or repeal ordinances (not repugnant to the constitution and laws of the state) to carry out the following powers conferred by the legislature.
3. To appropriate money for authorized purposes, and provide for current expenses.
4. To levy and collect taxes on property (real and personal) not to exceed 6 mills on the dollar in any one year for general revenue, and 6 mills more for improvements (exclusive of sewerage, assessable improvements and interest on bonds).
5. To levy and collect license taxes on trades and occupations, and authorize and regulate the issue of licenses.
6. To open, grade, and pave streets and cause sidewalks to be constructed, and repair the same, and assess the cost of the improvements on abutters, subject to majority consent and petition of abutting owners in case of grading and paving, and to petition of 25 taxpayers of the ward locus in case of the laying of new sidewalk (Gen. Stats. 1897, vol. 1, pp. 368-379).
7. To regulate the police, make regulations to preserve order and prevent interference with property, impose fines for violating ordinances and in default of payment to provide for confinement in the city prison or at hard labor.
8. To prohibit and suppress saloons, gambling houses, disreputable houses, indecent and disorderly practises, disturbances of the peace, assault and battery, and petit larceny, and provide for punishment.
9. To provide for punishment of persons wrongfully interfering with railways, pipes, lamps, etc., or wasting or appropriating gas, water, steam, hot air, etc.
10. The council shall prohibit the carrying of firearms or other dangerous weapons (concealed or not) and cause to be arrested and imprisoned, fined or set to work, all vagrants, tramps, confidence men and persons found in said city without visible means of support or legitimate business.
11. To establish fire departments, and fire limits and prohibit wooden buildings within said limits. To regulate and prevent dangerous or obnoxious manufactures or materials, etc.
12. To regulate the storage of powder, turpentine, hay, cotton, lumber or other combustibles—regulate deposit of ashes, construction of fire places, chimneys, buildings, etc.
13. To regulate and order the cleaning of chimneys.
14. To remove dangerous buildings, walls, etc., or require owner to remove them or make them safe.
15. To regulate the means of entrance to and egress from churches and public buildings.
16. To establish and regulate a night watch.
17. To provide for lighting the streets.
18. To compel the erection and maintenance of railings along dangerous ways.
19. To regulate railroad and street railway crossings and construction thru the streets and speed and means of preventing fires and accidents.
20. To adopt measures to protect persons and property of strangers and the traveling public.

21. To make quarantine laws and enforce the same within 5 miles of the city and adopt measures to prevent the introduction and spread of contagious diseases.
22. To make regulations to secure the general health, and prevent or remove nuisances, regulate cesspools, sewers, hogpens, slaughter houses, stock-yards, etc., or suppress the same, and enforce the cleaning of stables, yards, outhouses, places where garbage is kept, etc.
23. To erect, establish, and regulate hospitals, pest houses, work houses, houses of correction, etc.
24. To provide for election of city officers and regulate the same.
25. To provide for removing city officers for misconduct.
26. To regulate the duties and compensation of officers and servants not provided for in the statutes.
27. To require bonds and oaths from officers and agents.
28. To regulate the division of land into lots.
29. To close or vacate any street or alley or any portion thereof.
30. To regulate and require the planting of trees, building of cellar ways, doorways, awnings, lamp-posts, hitching-posts—regulate or prohibit awnings and structures projecting over or adjoining the streets or sidewalks, and excavations thru or under the sidewalks.
31. To regulate parks, public grounds, depots, and places of storage of freight and goods.
32. To regulate or prevent the running at large of dogs, cattle, etc., provide pounds and keepers, and tax the owners and harborers of dogs.
33. To establish or change the channels of streams and bridge the same; (but if the cost of the improvement is more than \$2,000 it must be *ratified by a majority of the legal voters of the city*).
34. To prescribe rules for weighing and measuring every commodity sold in the city, provide for inspection of grain, and weighing of hay, grain and coal and measuring wood and fuel, regulate places for selling hay, coal and wood, and provide for the inspection and condemnation of coal oil, gasoline, naphtha and all other inflammable oils, fluids or gasses used for heating or lighting.
35. To regulate markets and meat shops.
36. To regulate, establish and maintain markets, libraries, cemeteries, etc., and build or buy and operate gas, electric or other light works, etc. (See "Powers of Cities," above.)
37. To grant the use of streets (not to exceed 20 years) for water, gas, heat, or electric systems and fix charges (see "Powers of Cities," above) also to fix rates of cartage and transportation of persons and property except by steam railroads.
38. To grant rights of way in the streets for telegraph, telephone and electric light lines and to have exclusive power to license and regulate ferries. But no franchise, right of way or privilege of any kind can be granted by the mayor and council for more than 20 years.
39. To grant the right to construct railroads or street railways in the streets, but in cities of more than 40,000 people the mayor and council cannot grant such rights in any street without the *written consent of a majority of the owners of real estate fronting on said street*.
40. Private property may be taken by the city by right of eminent domain, for parks, streets, market places, depot grounds, quarries, bridges, buildings or other public improvements.

C. Functions of Mayor and Council in 2d class Cities.

1. Care and management of city, prop. etc. (See B, 1, above.)
2. To enact, alter or repeal such ordinances (not repugnant to the laws and const.) as they deem expedient for the good government of the city, the preservation of peace and order, suppression of vice and immorality, benefit of trade and commerce, and the health of the inhabitants, and enforce the same by fine not exceeding \$100 and costs, or imprisonment not exceeding 3 months, or both. One who cannot pay fine and costs may be required to work it out on the streets.
3. To levy taxes on real and pers. prop. (not to exceed 10 mills on the dollar for general revenue) and appropriate or borrow money by ordinance on vote of a majority of all the councilmen-elect. Statements of receipts, expenditures and indebtedness, must be published quarterly.
4. To levy and collect license taxes on auctioneers, corporations, concerts, hotels, newspapers, omnibuses, etc. Also to tax the owners and harborers of dogs.
5. To impose a poll-tax not exceeding \$1 on all able-bodied males between 21 and 50. (For Road Work Tax see above notes to City Table.)
6. To open or vacate streets, and to build sidewalks, provide sewers or pave and improve streets, and assess the cost on abutters; subject, in case of paving or improving streets, to the assent or absence of protest of a majority of abutting owners.
7. May regulate the planting of shade trees, prohibit encroachments into or upon the streets and sidewalks and regulate the building of cellar ways, stairways, railways, doorways, posts, rails, etc., and structures projecting into or adjoining the streets, etc. (See B, 30.)
8. May prohibit the carrying of firearms, arrest, imprison, fine or set to work all vagrants, etc. (See A, 10.)
9. May suppress saloons, gambling houses, billiard tables, bowling alleys, disorderly houses, desecrations of the Sabbath, and all kinds of public indecencies.
10. May prohibit riots, assaults, petit larceny, immoral shows—prevent or punish discharge of firearms, powder, etc., in public streets or grounds.
11. May prevent and punish horse racing, fast driving, etc.
12. May prohibit the running at large of hogs, cattle, etc., establish a pound, and tax dogs. (See B, 32.)
13. May regulate crossings, running of cars, speed, tracks, depots, levees, etc.
14. May buy fire engines, etc., organize fire companies, establish fire limits, and regulate the construction and maintenance of chimneys, fireplaces, ovens, boilers, etc. (Compare B, 11 to 15.)
15. May make regulations to secure the health of the city, remove nuisances, prevent introduction of contagious diseases, and make quarantine laws and enforce the same within 5 miles of the city. (See B, 21, 22.)
16. May erect and regulate markets and public buildings or contract for the erection and regulation of them.
17. May establish or change water courses, establish and regulate public wells, cisterns and reservoirs.
18. May erect and regulate poor houses, work houses, hospitals, water-works. (See also general "Powers of Cities," above.)
19. May provide by contract for lighting the streets. (See larger power above under "Powers of Cities.")

20. May purchase land for cemeteries and lay out and control the same.
21. May establish and maintain public libraries and reading rooms.
22. May exercise the power of Eminent Domain for any necessary purpose.
23. May adopt a method of numbering the buildings.
24. May encourage manufactures by appropriations or bonds, provided that no more than \$1000 is appropriated for any one purpose unless more is authorized by the people on a referendum vote.
25. May regulate the weighing and measuring of every commodity sold in the city, and the inspection of hay, grain, coal, etc. (See B, 34, above.)

In addition to the general charter for cities of the 2d class, there is a special act relating to 2d class cities over 10,000 population, to which we have already referred in speaking of road districts. This act confers further powers on said cities which bring them closer to 1st class cities than the other cities of the 2d class, and in some respects carry them even beyond the privileges expressed in the charter of 1st class cities. The main peculiarities of the said special act are as follows:

1. Cities of the 2d class over 10,000 pop. may levy taxes on prop. (without the 10-mill limit).
2. May levy license taxes and regulate *all* callings and occupations in the city.
3. May compel owners to erect railings, etc., on dangerous ways. (See B, 18.)
4. May take down and remove dangerous or insecure buildings. (See B, 14.)
5. May grant the use of streets for water, gas, steam and electric conduits, pipes, etc., under such restrictions as will protect the public and secure proper remuneration for the grant; provided that no franchise, right of way, or privilege of any kind shall be granted by the mayor and council for a longer period than 20 years. (Compare B, 37.)
6. General health, nuisances, cesspools, etc.—a full and specific provision like that condensed in B, 22, above.
7. May compel owners to keep sidewalks and gutters clean and free of ice, snow, etc.
8. May regulate the means of entrance to and egress from public halls, churches, and buildings. (See B, 15.)
9. To change the boundaries of wards and reduce their number to not less than four.
10. To abolish the office of city treasurer and treasurer of the school board and confer their powers on the city clerk.

The act declares further that these cities (2d class of more than 10,000 people) shall not be liable for defective sidewalks or streets or obstructions thereon unless written notice of the defect is filed with the city clerk at least 30 days before any accident by reason thereof.

D. *Functions of Mayor and Council in 3rd class cities.*

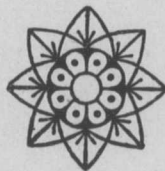
The charter act for 3d class cities confers upon them substantially the same powers as those above cited from the general charter for all 2d class cities, with the exception of the last two of the said powers. The 24th power is not given to 3d class cities and the 25th is modified to a power to provide for inspection and weighing of hay, grain, coal, cattle and hogs, measuring wood for fuel, regulating places for sale hay, coal and wood, etc.—no specific power is given to

make rules for weighing and measuring every commodity as in 1st and 2d class cities.

A 3d class city may dissolve and abandon its corporate existence upon a referendum vote at the polls initiated by petition of a majority of its legal voters.

E. *General Remarks.*

In the statutes dealing with cities there is a great deal of repetition. Provisions substantially the same and in many cases verbally identical are repeated two, three and even four times. A condensation and simplification of the law relating to municipalities would seem to be very desirable. Indeed there is reason to believe that clearness, economy, liberty, good government and local public spirit and development would be aided by reducing municipal law to a brief statement of the principle that any city or town shall be free to take any action it may deem best in respect to its local affairs so long as it does not do anything that is *forbidden* by constitution or statutes, subject only to reasonable provisions in respect to debt limit, civil service rules and popular initiative and referendum upon all ordinances and amendments to any local constitution or charter the people might see fit to adopt. These are substantially the principles at the core of the California Charter Law and the new Freehold Charter of San Francisco, and seem calculated to afford cities a fuller self-government in purely local affairs, while greatly relieving the pressure upon the legislature by confining its action to state interests.



THE COLLEGE APPROPRIATION.

BY THOS. E. WILL.

FRIENDS of the College are naturally interested to know how the institution fared at the hands of the legislature in the session just closed.

Regents and faculty have fully appreciated that the increase in numbers of students, the multiplication of courses, and the branching out upon new lines of work, demanded by the needs of the agricultural and industrial classes, necessitated largely increased appropriations. Classes must be housed and taught, and laboratory facilities must be provided, if the institution is to serve the people as it should. The problem was, How shall we compress our wants into a compass that shall not seem to the powers that sit in judgment upon the many institutions and interests of the state wildly unreasonable in the light of previous appropriations of \$10,000, \$15,000, and \$18,000 per annum to the Agricultural College? A sum slightly less than \$200,000 was agreed upon, from which were omitted such highly desirable items as a president's house to replace that destroyed by fire four years ago, a dormitory to accommodate the increasing number of students for which the slow growth of Manhattan does not provide, additional room for the department of Veterinary Science, one of the most valuable institutions in the state to the farmers and stockmen, and other important items.

The senate ways and means committee, however, insisted on cutting the bill in half, excluding among other things the greatly needed building for physics and chemistry and allowing the College but a round hundred thousand dollars. After earnest effort the committee was induced to allow the bill to stand at \$125,000, which was later raised to \$128,000 in the committee, at which figure it passed the senate.

Meanwhile the house ways and means committee had considered appropriation bills for the State Normal School and State University, and allowed the Normal School between \$90,000 and \$100,000, a considerable reduction from the amount asked; and the University \$330,000, a reduction of \$101,000 from the amount asked by that institution. The Normal bill passed the senate with a slight additional reduction, while the University bills passed the senate unmodified except by an increase of \$65,000 for a natural history museum.

On the same night on which the University bill, thus increased, passed the senate, the College bill was reduced in the house committee by \$26,900. In this form it passed the house. An earnest effort was made on the floor of the house to secure an amendment allowing \$2500 per annum for experimental work in the improvement of seed by breeding. This effort failing, an attempt was next made to restore the items rejected by the house committee, including \$3000 for equipment of Agricultural and Dairy department; \$2500 for purchase of a dairy herd and provision for shelter; \$3000 for additional building for Mechanical department; \$2000 for equipment of same department; \$7400 for enlargement of library building, in which it was hoped to secure adequate quarters for the Veterinary department and an additional class room; \$1000 annually for books and other literature; \$1500 annually for general repairs of buildings, walks and drives and maintenance of grounds, and \$3000 for establishing a business course. This attempt also failed, and the bill passed the house as recommended by the committee.

Next followed a conference committee, in which something less than 40 per cent of the lost ground was recovered, and the total appropriation for the two years brought up to \$111,600, in which form the bill became a law.

Naturally the friends of the College regret that the original College bill, omitting as it did items that could but ill be spared, should have suffered severe reductions in both houses. They do not forget, however, that there are other institutions and interests in the state which cannot be overlooked, that the legislature just adjourned has been unusually liberal, and that the College itself has fared far better absolutely than ever before—the legislature of 1897 allowing it but a trifle over \$50,000, of which \$10,000 went to meet a deficiency of some years' standing, and \$16,000 more to erect and equip the Domestic Science Hall, leaving but about \$24,000 for all other purposes for the biennium, the income from endowment and federal government not counted. Nevertheless, with the continuation of the unprecedented growth of the institution, severe economies will be necessary to carry it thru the biennium.

To its many friends in both houses the College feels especially grateful. Among these should be mentioned the senator from Riley county, Hon. John E. Hessin, and the representative from the same county, Hon. George T. Polson; the chairman of the senate ways and means committee, Senator A. G. Fornéy, who twice visited the Col-

lege during the legislative sessions; Senators Stocks and Field, who on both the ways and means and conference committees rendered the College yeoman service; Senators Anderson, Coleman, Titus, Pritchard, Young, Householder, King, Hanna and Hart; Representative Rees of Ottawa, class of '85 of K. S. A. C., who on both ways and means and conference committees stood by his alma mater; and Representatives Gillispie, Sweet, Keifer, Scott of Elk, Brooke, Coy, Wheeler, Mendenhall, Godshalk, Loomis, Babb, Fairchild, Jaquins, Wright of Lyon, McClaren, Martin, Marks, Ravenscraft and many others in both houses. Regents Hoffman, Hudson and Vrooman also contributed of their time and service. Former regent Daughters rendered valuable aid at a critical moment, while Messrs. E. B. Cowgill, Col. T. W. Harrison, Guilford Dudley, John R. Mulvane and G. C. Clemens contributed their good will and influence. Among the newspapers which have aided the College, especial mention should be made of the *Topeka Capital*, which in season and out of season, by editorials, interviews, and in other ways, has pressed upon the attention of the people and the legislature the fact that the College established to serve the agricultural and industrial classes must be given opportunity to do its work. The *Advocate and News* and the *Kansas Farmer* also worked loyally for the institution.

The College bill, as finally passed, is as follows:

An act making appropriations for the erection and equipment of certain buildings, for repairs and current expenses of the Kansas State Agricultural College, for apparatus and equipment, and the enlargement of the library and other buildings, for the construction of a sewer and certain other improvements herein named, for keeping in repair buildings already erected or to be erected, and for the maintenance of said College for the fiscal years ending June 30, 1900, and June 30, 1901.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. The following sums, or so much thereof as may be necessary, are hereby appropriated out of any money in the state treasury not otherwise appropriated, to the Kansas State Agricultural College for the fiscal year ending June 30, 1900, and for the fiscal year ending June 30, 1901, for the purposes hereinafter mentioned.

FOR THE FISCAL YEAR ENDING JUNE 30, 1900.

| | |
|---|-------------|
| FOR AGRICULTURE, DAIRY AND PHYSICAL SCIENCE: | |
| Building for Agricultural department..... | \$25,000 00 |
| Equipment of Agricultural and Dairy department..... | 6,000 00 |
| Purchase of Dairy herd, and provision of shelter | 3,000 00 |
| Equipment of Chemical department..... | 1,000 00 |
| Equipment of Physics department..... | 1,000 00 |
| FOR MECHANICAL AND CIVIL ENGINEERING DEPARTMENTS: | |
| Buildings, additional..... | \$9,900 00 |
| Equipment—mechanical, \$7000; civil engineering, \$500..... | 7,500 00 |
| Additional boilers, fireproof boiler-house and engine | 5,000 00 |

FOR LIBRARY:

| | |
|---|------------|
| Completion of room and book stacks..... | \$4,200 00 |
| Books and other literature | 1,500 00 |
| For furnishing, heating and lighting addition to library..... | 1,000 00 |
| For microscopes and other equipment of Veterinary department..... | 950 00 |
| For sewing machines..... | 340 00 |
| For greenhouse enlargement, and horticultural equipment and appliances.. | 1,000 00 |
| For bath-rooms and water closets | 500 00 |
| For current expenses, additional teaching, assistants and student labor..... | 10,000 00 |
| For equipment of gymnasium..... | 250 00 |
| For general repairs of buildings, walks and drives, and maintenance of grounds..... | 3,000 00 |
| For freight and hauling coal..... | 1,650 00 |
| For water supply..... | 600 00 |
| For salary of loan commissioner .. | 300 00 |
| For incidental expenses in care of funds..... | 150 00 |
| For state veterinarian's salary and traveling expenses.. | 1,800 00 |
| For accrued and accruing rent for president's residence..... | 560 00 |
| For farmers' institutes | 2,000 00 |

For the construction of a sewer for the use of the Kansas State Agricultural College there is hereby appropriated the sum of three thousand dollars, or so much thereof as may be necessary, and the board of regents of said College are hereby authorized to construct said sewer from said College to the river by the most practicable route, or form a junction with the sewer of the city of Manhattan at a point to be designated by said board, providing the conjunction of the said city and College sewers is for the best interest of the state.

FOR THE FISCAL YEAR ENDING JUNE 30, 1901.

| | |
|---|------------|
| For general repairs of buildings, walks and drives, and maintenance of grounds..... | \$3,000 00 |
| For books and other literature for library..... | 1,500 00 |
| For freight and hauling coal..... | 1,650 00 |
| For water supply..... | 600 00 |
| For salary of loan commissioner..... | 300 00 |
| For incidental expenses in care of funds | 150 00 |
| For state veterinarian's salary and traveling expenses | 1,800 00 |
| For rent of president's house..... | 300 00 |
| For current expenses, additional teaching force, assistants and student labor | 10,000 00 |
| For farmers' institutes..... | 2,000 00 |

SEC. 2. In case there shall not be sufficient funds to complete the buildings and improvements herein mentioned or any of them, or in case said buildings or improvements or any of them shall not be begun or completed during the fiscal year ending June 30, 1900, the foregoing appropriations or each of them shall be available for the purposes named and payable by the state treasurer during the fiscal year ending June 30, 1901; and if by proper management and legitimate economy the board of regents of said College finds that it is not necessary to expend the full amount appropriated for the various items named in section 1 of this act, the amount remaining to the credit of said funds may be used by them for the payment of current expenses of said Agricultural College, and the auditor of state is hereby authorized to issue his warrants in accordance with the provisions of this section.

SEC. 3. The auditor is hereby authorized to draw his warrants on the treasurer of state for the purposes and amounts specified in this act, or so much thereof as may be necessary to liquidate all such claims as may be presented to him out of such appropriations: *Provided*, That no account shall be audited unless an itemized statement is furnished, verified by affidavit, showing that said appropriations are to be applied to the specific purposes only for which they were appropriated.

SEC. 4. In all cases in which, by the provisions of this act, appropriations are made for specific purposes named or causes stated, the officer or person

having charge of such appropriations shall in no case, by any contract, act, or proceeding, obligate the state of Kansas at any time to pay a larger sum than is herein specifically appropriated.

SEC. 5. The erection of the buildings provided for by this act shall be by and under the direction of the board of regents of the Kansas State Agricultural College.

SEC. 6. This act shall take effect and be in force from and after its publication in the official state paper.

Against the \$111,600 received by the College, the University received \$330,000, including a \$55,000 chemistry building and a \$30,000 mechanical building; and the Normal School received \$90,500.



MAKERS OF THE KANSAS STATE AGRICULTURAL COLLEGE.

BY JOHN D. WALTERS.

IX. Hon. Eduard Secrest.

DURING the thirty-eight years of its existence the Kansas State Agricultural College has had about a hundred regents. The majority of the members of the governing board have been men of no particular attainments or ideals—successful farmers, perhaps, or business men, but often densely ignorant of the mission and work of a college of practical science. Others were merely politicians—men who had assisted their party in managing a town or county election and on the strength of their political manipulations “expected something” in return—a regency of a state institution if nothing richer. Still others were men who had read much and thought much—men who had had but little experience, perhaps, in the realms of higher educations, but who had high ideals, common sense, and progressive ideas—men who believed in a better future for mankind and were willing to contribute their mite toward bringing it nearer. The subject of this biographical sketch is a type of the latter class.

Hon. Eduard Secrest was born in 1833 near Winterthur, canton of Zurich, Switzerland, and spent his boyhood in that country. From a letter which he lately wrote to a friend in Manhattan, we quote the following concerning his school days:

“I had just got a glimpse of the excellent school system of the land of Pestalozzi, and had entered the county high school at the age of 14,

when my father, a poor but well-read linen weaver with decidedly socialistic leanings, desirous of a larger arena in which his children might carry on the struggle for an existence, sadly bid adieu to the land of his ancestors who fought kingcraft and priestcraft one hundred years before Christopher Columbus was born." The family settled in the backwoods of southern Indiana, where Eduard had a chance to top out his education with some English reading and writing in a country log school house. He became an expert with the ax and rifle and learned to love the freedom of the Hoosier farmer boy.

After helping his father hew out a home in the primeval forest he started for Kansas in the spring of '55. Landing in Kansas City, Mo., then a rough-and-tumble frontier town of 500 or 600 people, he taught school in the triangular bottomland formed by the junction of the Kaw with the Big Muddy, right in the center of what is now covered by the packing houses and great stock yards and their thousands of humming and buzzing appendages and auxiliaries. In '56 he came to Riley county and founded a prairie home on Fancy creek, now one of the finest farms in Kansas.

When the war broke out Mr. Secrest enlisted in the Union army, and carried "Old Glory" at the head of the 13th Kansas volunteers over the Boston mountains into Arkansas and thru the Indian Territory. On his return to the farm on Fancy creek he was elected representative of Riley county and had a chance in '69 and '70 to assist the Agricultural College in the legislature.

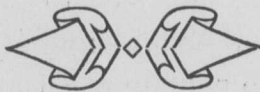
Tho living over twenty miles from the county seat, and far from the railroad, Mr. Secrest never neglected his self-improvement. He bought books and magazines, attended educational meetings and became a man of advanced ideas in sociology, politics and religion, as well as in farming. He became a color bearer in peace as he had been in war, and tho he wanted no office of any kind, his many friends, without his knowledge, petitioned Governor Lewelling in '93 to appoint him a regent of the Agricultural College. It is an interesting fact that the petition was written and circulated by Manhattan republicans, tho it was well known that Mr. Secrest was a populist.

At the time of his appointment Mr. Secrest had already attested his belief in the practical education given at the State Agricultural College, by building near the gate a cottage for the accommodation of his children while in College. Two of his daughters had graduated with high honors, his oldest son was a student, and another son

was about to enter the course. From this time on Mr. Secrest came to Manhattan often and made it a rule to stay at the College for a day to attend the lectures and laboratory work of the different departments. Everybody was glad when he came, for it was a joy to see the bright black eyes of the plain, old farmer gleam as points of special interest were brought out in the discussions of the class rooms. He gradually became a warm friend and advisor of the faculty, as well as their trusted regent, and all regretted that two years later the ever revolving political wheel of the state rotated him out of the position for which he was so eminently fitted.

The writer must ask pardon for divulging the following characteristic act of Mr. Secrest. Few of the friends of the College and, perhaps, none of the faculty know that Mr. Secrest turned every cent of his regent's salary, as soon as the quarterly pay checks arrived, over to Pres. Geo. T. Fairchild to be distributed among the most needy students; and that the only condition which he exacted of the president was that the name of the donor should not be made public.

Several years have passed since then and Mr. Secrest has grown old and gray; one of his daughters became a professor at Leland Stanford university and died as a member of the faculty of that institution; his oldest son is managing the handsome farm near Randolph; while the sturdy veteran is still a frequent visitor at the Kansas State Agricultural College, and everyone—students as well as professors—welcome him as one of the "Makers of the largest agricultural school in the world."



HARDY ORNAMENTAL SHRUBS.

[Press Bulletin No. 17, Department of Horticulture and Entomology. Experiment Station, Manhattan, Kansas.]

THE person who is expecting to add any new features of beauty to his home grounds in the coming spring should begin now, if he has not begun already, to perfect the plan by which he is to proceed. If one does not plan he is sure not to execute or to execute improperly. The ornamentation of the home, above all things else, should be done with forethought and mature consideration. If you would be satisfied with your home and contented in it, then, in planting, sowing and pruning, adopt a plan and follow it.

It is not enough to adopt a plan in time. It is essential also to order in due time the stock you wish to plant. Nurserymen cannot, and most of them do not claim to guarantee their late shipments as they do their early ones. It is in late orders that substitutions of variety and quality are made. Order in time. Decide on what you want and order from the nearest reliable nurseryman. If he does not have it he will procure it for you or give you the addresses of those who do have it. This department is always ready to furnish the addresses of reliable firms to those who ask.

The question of soils is scarcely to be considered, since almost any soil to be found in the state is capable of supporting the best of our handsome bloomers. However, the physical condition of the soil may be such as to require some treatment before committing a valuable shrub to it. If the subsoil is hard and tenacious it should be broken up so that the roots of the plants and moisture can penetrate it. For large plots a subsoil plow is best, but for single plants, or for a small number, a spade is effective. Dig a hole wide enough and deep enough for the roots to grow uncramped for a year or two. Fill in the bottom of the hole with surface soil and tramp it until it is firm. It is best to set the plant a little deeper than it grew in the nursery. Before placing it in the ground see that the broken and torn roots are all cut away. If the ends of the roots are injured they should be pruned off, leaving a smooth cut. Further than this, root-pruning is of very doubtful efficacy.

The tops may, perhaps, be shortened advantageously, but if the top is of good shape severe pruning is not desirable. The soil should be packed firmly around and over the roots to the level of the

ground, but if dry weather is expected, leave the soil around the plant lower than the surrounding surface. This method has been found of great advantage in the drier portions of the state.

The following shrubs, arranged in the order of their blossoming period, have been found perfectly hardy at the College and have, besides, the highest attributes of beauty, dignity and grace:

Pyrus Japonica (Japan Quince).—An upright bush bearing scarlet flowers very early in the spring before the leaves are out.

Spiraea Prunifolia (Bridalwreath).—A small spreading shrub, five feet high, bearing small white double flowers in great profusion.

Spiraea Van Houtii.—A very graceful shrub, six feet high, spreading, bearing a wealth of white blossoms in early spring, about a week later than *S. prunifolia*.

Lonicera Tatarica (Bush Honeysuckle).—An upright shrub, eight feet to ten feet high, bearing handsome pink or white flowers in rather early spring.

Philadelphus Coronarius (Mock Orange).—An upright shrub, resembling in habit the one described next above.

Viburnum Opulis Sterilis (Snowball).—Well known; excelled by none in its grand white clusters in rather late spring.

Caragana Arborescens (Siberian Pea).—A legume of beautiful upright habit, and dense, soft foliage, bearing small yellow flowers in late spring.

Tamarix Juniperinus.—A tall, graceful shrub, with foliage resembling the cedar. Bears small pink blossoms in spikes in late spring and early summer.

Spiraea Bumalda.—Small, one to one and one-half feet high. Bears pink blossoms in corymbs in June and July.

Hibiscus Syriacus (Althea).—Small shrub, four to five feet high, bearing brilliant white flowers in July.

Hydrangea Paniculata Grandiflora.—This shrub opens its grand clusters of blossoms in July and holds them till August. Unsurpassed in beauty.

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THE INDUSTRIALIST.

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Manhattan, Kansas.



PRES. THOS. E. WILL, Managing Editor.

PROF. JOHN D. WALTERS, Local Editor.

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LOCAL NOTES.

Mrs. Emma (Spohr) Huggins, of Emporia, was among the visitors in chapel, March 4.

Fred Zimmerman, '98, is now the foreman of Doctor Still's famous dairy herd at Kirksville, Missouri.

W. B. Chase, '97, is now a partner in his father's mercantile business, having purchased the interest of his father's previous partner.

Mr. P. J. Parrott returned, March 13, from New Mexico where he has been for the past two months studying a number of injurious insects.

The Webster Annual, Saturday, March 11, was a complete success in every respect. The attendance was large in spite of the very ugly weather.

Hubert C. Avery, captain-elect of the Kansas University football team, and Miss Nellie V. Criss of Lawrence were married February 19. Mr. Avery was a second year student here in '96-7.

I. D. Gardiner, brother-in-law of Prof. J. T. Willard, died at Wakefield, of erysipelas. Mr. Gardiner graduated from the Agricultural College in '84. The wife who now mourns his death was Miss Ida Quinby, who also graduated in '86.

Mr. J. E. Nissley delivered a stereopticon lecture on the "Growth and Development of the Dairy Industry in Kansas," in the College chapel, March 3. There were about 250 students present and the lecture was well received.

E. M. S. Curtis, '93, is now located in the office of the Missouri Pacific railway at St. Louis. An appreciative increase in recompense induced him to accept the present place in preference to a similar one he has held in Detroit for several years.—*Students' Herald*.

Everybody is much pleased that Mr. W. H. Phipps, '95, has been chosen secretary of the College. Since graduation, Mr. Phipps has had a varied business experience, which together with his service as regent will undoubtedly enable him to fill this position in a very acceptable manner.

The faculty are considering the question of adding a commercial science course and a short course for farmers to the present courses of instruction. The former is to be a four-year's course that will

rank with the other courses. The latter, if organized, will cover the winter terms of two consecutive years. The question of lengthening the present four-year courses is also under consideration.

On Wednesday, Feb. 22, Miss Stoner and the advanced class in domestic science gave a formal reception to the student body, receiving from two till six o'clock, P. M. The students were received in divisions according to classes, each having special hours to call. The day was a stormy one, yet the attendance was good.

It is expected that the dairy number of THE INDUSTRIALIST this summer will, as last summer, be made a special commencement number. The addresses delivered by distinguished speakers at commencement will furnish highly entertaining articles. It is hoped that it may be sufficiently attractive to receive a wide sale.

The Agricultural department succeeded in getting Secretary Coburn to ship by freight a number of the eleventh biennial report of the State Board of Agriculture. By having them sent this way the books cost one cent apiece, saving twenty-eight cents on each one—twenty-one dollars on the number of books secured.

Asst. R. W. Clothier returned on the first of March from a two days' institute at Castleton, in Reno county. He reports great enthusiasm: seats, window sills, and platform all full. Among other features they had him give two talks on the advantages of attendance at the Agricultural College, for which purpose the pupils of three schools were assembled.

The legislative committee who visited the College on March 1 was received at chapel by the student body and faculty. Thruout the morning they were shown the crowded class rooms and laboratories. Representatives Gillispie, of Butler county, and Keifer, of Neosho, spoke for a few minutes, Thursday morning, in chapel. They were surprised at the large attendance and the general maturity of the student body.

The navy of the United States is well known for its recent deeds, but its make-up is not familiar to most people so far inland as Kansas. A letter was recently received from a young man who wants to enter the navy, and as preparation therefor was thinking of entering the College Mechanical department. He was advised that this would probably be a satisfactory means of acquiring the mechanical skill and intelligence which is required of even enlisted men in the naval service.

A subcommission on agriculture and agricultural labor, working under the industrial commission recently appointed by act of congress, called upon the office of experiment stations at Washington to show them the relation of the work of the agricultural colleges and experiment stations to practical agriculture. The Kansas station as well as others has been called upon to furnish information. The report is exceedingly interesting, and shows that the experimental work and scattering of information has been and is in the highest degree useful to the state.

Mr. Fred Wilkinson, of Yates Center, makes an inquiry which comes to the station many times every day of late. He writes: "I have just received your press bulletin No. 24, and am very much interested in the soy bean, and I desire to get seed of the same. Do you know where I can get some, and at what price? Please reply at once. I am a dairy farmer and am interested in 'protein.' Please continue to send me all publications. I value them very highly, and I think the Kansas Experiment Station is doing a grand work not only for Kansas but for the whole United States."

The second year horticulture in the winter term of 1898-9 was deferred because of the leaving of Professor Faville. It is found practically impossible to give both the horticulture and the second year spring entomology in the spring term of 1898-99. Therefore the following adjustment has been made: The second year winter term horticulture takes the place of the second year spring term entomology, and will be made a five-hour instead of a three-hour study. The entomology thus displaced will be added to the work laid out for the spring term of the third year, but be reduced for that term from a five-hour to a three-hour study.

Mr. Henry E. Alvord, formerly president of the Association of American Agricultural Colleges and now chief of the dairy division in the bureau of animal industry at Washington, writes to the College on a matter of business, and says in closing: "Let me add that I am interested in your College thru early acquaintance with it, and because I have had a number of good friends in its service. I knew its first president well, and used to ride over from Fort Riley, when I was in command there, more than thirty years ago, to watch with interest the early development of your institution. The College and your administration of it have my most cordial good wishes."

Professor Walters is working on the plans and specifications of the new agricultural building. It is intended to have everything ready for bidders within two or three weeks. The proposed location of the buildings is upon the site of the ruins of the president's residence destroyed by lightning in 1895. The building will measure 104 by 100 feet, two stories high. There will be a 12-foot basement, built of heavy ashlar rock. The interior will be lined with glazed brick laid in cement. The structure will contain a large creamery room, a cheese room, three class rooms, a laboratory, a library, several offices, a boiler room, an engine room, a cold storage room, and several cloak rooms and lavatories.

A circular has been issued containing the names of persons from whom soy bean seed may be obtained; and it is sent to those asking for it. A large number of inquiries have come for this information since the bulletin on soy beans was issued from the Experiment Station. The College cannot furnish soy beans, either free or for pay. Formerly samples of the seed were issued in packages of one quart, but this was found unsatisfactory, as so small a patch of bean plants is likely to be eaten up by rabbits. Some seedsmen list the seed as soja beans and some as coffee beans. The price ranges from

\$2.50 to \$6.00 per bushel. Half a bushel of seed per acre is the proper amount. Copies of press bulletin No. 24, describing the uses and culture of soy beans, may be obtained by addressing Kansas Experiment Station, Manhattan, Kansas.

Prof. E. M. Shelton, formerly of this College, but lately president of the agricultural college at Queensland, Australia, visited his old home last summer. The following is an extract from an interview by an Australian paper, which gives his impressions about agricultural colleges and their influence in this country: "While in the states I visited several of the largest agricultural colleges and of course found much to interest me there. At Manhattan, Kansas, the site of my old-time labors, the students' roll has reached over 700. I also spent a couple of days pleasantly at Berkeley, California, looking into the splendid equipment of that great university. One fact I wish to bear testimony to, and that is the great influence of these industrial educational institutions. I found the students and graduates engaged in all occupations, for no pretense is made there that the graduates of the agricultural colleges will be farmers altogether. Some are lawyers, some are business men, some teachers, and a good many go directly to the farm. But whatever their occupation, I found these men and women thoroly in earnest in respect to the development of the resources of the states and districts in which they happen to live. For instance, the state of Kansas produced this year something like 22,000,000 bushels of wheat, and over 200,000,000 bushels of maize. These great facts of production sustain an intimate connection with the 700-odd students at work at the Agricultural College.

THE PRESS

The Manhattan INDUSTRIALIST for March is a valuable number for students. It contains a very complete chart and article on "Civics Analyses."—*Anthony Republican*.

The articles in the February number of THE INDUSTRIALIST indicate thoughtfulness and thoroness in educational work as represented by this leading Kansas institution.—*Philadelphia City and State*.

This College is a promotor of the state's interests and advancement rather than a charge upon its resoures. It is returning for the money invested not only men and women so educated as to be able to accomplish much in the field of industry, especially the industry of farming, but it is also discovering and making applicable better methods of utilizing the great resources of the state.—*Kansas Farmer*.

In speaking of the pending appropriation bills during the session of the legislature, the Topeka *Capital* had many a kind word for the Agricultural College. It pleaded with the committees on ways and means to be "as considerate of its pressing needs as it showed itself toward the university." It impressed the members of the legislature with the fact that "This College is close to the heart of the producing class of the state." And it assured them that "The money asked for the purposes named will come back to the taxpayers with 100 per cent interest every year."

ROSTER OF THE NEW BOARD.

President Will has received the following information from the governor's office regarding the *personnel* of the Board of Regents of the Agricultural College at this time:

Members holding over—

C. B. HOFFMAN, Enterprise.....term ending April 1, 1901
 SUSAN J. ST. JOHN, Olathe.....term ending April 1, 1901
 J. N. LIMBOCKER, Manhattan.....term ending April 1, 1901
 CARL VROOMAN, Parsons.....term ending April 1, 1901

New members appointed—

WILLIAM HUNTER, Blue Rapids, vice E. B. Cowgill, term ending April 1, 1903
 J. M. SATTERTHWAITE, Douglass, vice W. H. Phipps, term ending April 1, 1903
 E. T. FAIRCHILD, Ellsworth, term ending April 1, 1903, to succeed T. J. Hudson

A SOUND MIND IN A SOUND BODY.

At the entertainment given by the college athletic association on the evening of February 27, President Will spoke in substance as follows, on the topic "A Sound Mind in a Sound Body:"

"Athletics found its golden age in ancient Greece. In no land was it ever held in higher honor. The Isthmian, Nemean, Pythian, and especially the Olympian games were national events. Wars ceased during the games. Time was reckoned by the Olympiads. The best energies of the Greeks were taxed in preparing for the quadrennial contests in honor of the Olympian Zeus. The events consisted of running, leaping, throwing the discus and spear, and the like. The victor, crowned with a simple wreath of wild olive, returned as a conqueror to his native village, where almost the entire population turned out to meet him and where substantial honors and rewards awaited him.

"The Greek games contributed much toward the development of the finest, most perfect human being known to antiquity, if not to modern times. The reason lay, however, not simply in the fact of physical exercises but in the ideal striven for. The Greek abhorred excess. He sought harmony, symmetry, balance, perfection; one organ or faculty was never highly cultivated at the expense of another. Mental training accompanied physical. Everything was subordinate to the ideal of perfect poise, and all-round, manly beauty.

"In war-like, cruel Rome and even more in the chaos that followed the breakdown of the Roman civilization the Greek ideal was lost sight of. The type of the middle ages was the ascetic; weighed down by the sense of sin which he conceived as residing in the flesh, his entire thought was occupied with the warfare between flesh and spirit. That the soul might be exalted, the body, he believed, must be debased; hence his fastings and cruel scourgings and the many exercises whereby he sought to degrade and subdue the body. With such a people athletics could have no place. The result of asceticism was an unsound mind in a dwarfed, diseased and wretched habitation.

"In recent times the pendulum has swung again. Medieval ideas of sin and separation have been in a measure forgotten. The body is again esteemed and athletics has revived. In Eton and Rugby and the other English preparatory schools, as well as in English

colleges and universities, along with the national games of cricket and football the amateur athletic sports are much in vogue; running, the high leap, the wide leap or broad jump, vaulting, steeple chasing, hurdle racing, throwing the hammer and putting the weight standing as the leading events.

"From England, interest in athletic sports has spread to eastern American colleges; and, later, to western, till our own now feels the impulse. As is usual, the pendulum which swung so far toward other worldliness and physical degradation has in modern times swung entirely past the golden mean marked by Greek athletics, to the extreme of undue physical exaltation. In some eastern colleges it is hardly an exaggeration to say that the body is made everything and the mind practically nothing. Beef supplants brain; muscle is canonized; the mere athlete is worshipped, the scholar ignored. Such mental unsoundness is accompanied by a corresponding physical unsoundness. Athletics or physical development made an end in itself misses its purpose with the result that the mere athlete often breaks down physically at an early age.

"Need we fear such an exaggeration of athletic interest in our own College? Hardly. Our young people have been trained and toughened on the farms before coming to College. The use of the muscles fails to intoxicate them as it does the untrained striplings from the city. Again, the blending of physical and mental exercises in our College course aids greatly in maintaining an equilibrium. Yet the splendid Greek ideal needs to be held up before the students in K. S. A. C. as well as elsewhere. It should never be forgotten that the object of all our work in class room, laboratory, shop, and on athletic field is the development of the all-round balanced man or woman; and we may even go beyond the Greek and seek this symmetrical development, not primarily for beauty in itself nor for personal enjoyment, but for service of ourselves in striving toward the attainment of our highest ideals and in service of our fellowmen and of our common country. Thus the sound mind and sound body combine to produce the higher civilization."

How often you hear this: "Oh, Yes, Esterbrook's; why, that is the pen I used when a boy at school." And the rejoinder: "You will never regret it."

Outing for March is a seasonable and satisfying number, which carries many fine illustrations. Walrus hunting, fishing, snow shoeing, shooting, articles upon terriers and spaniels, wolf hunting, bicycling and yachting, afford a pleasing variety.

The Greater America Exposition agrees to place at the disposal of the State Board of Agriculture whatever space may be found necessary for a creditable exhibit in the Agricultural, Horticultural, Dairy and Apiary buildings, and to afford proper accommodations for all the live stock that may be placed on exhibition.

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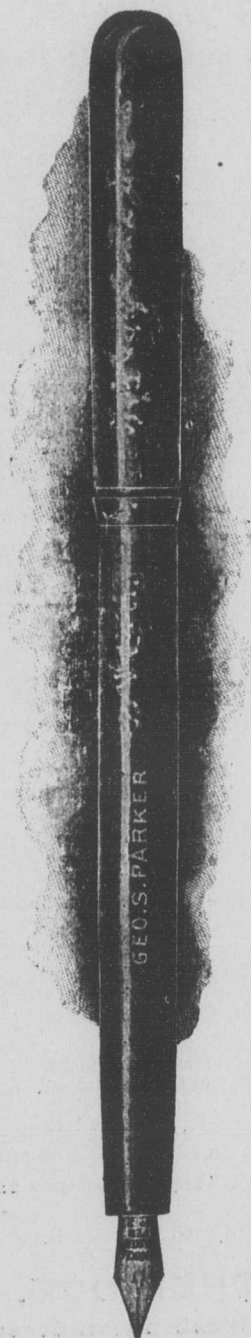
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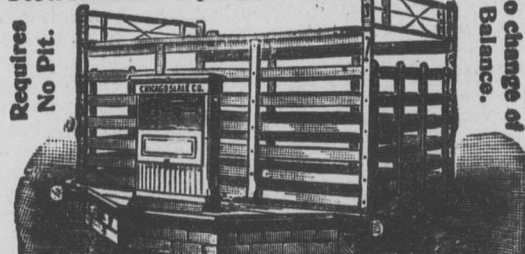
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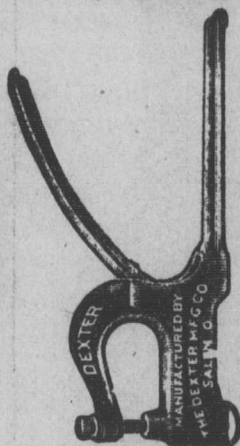
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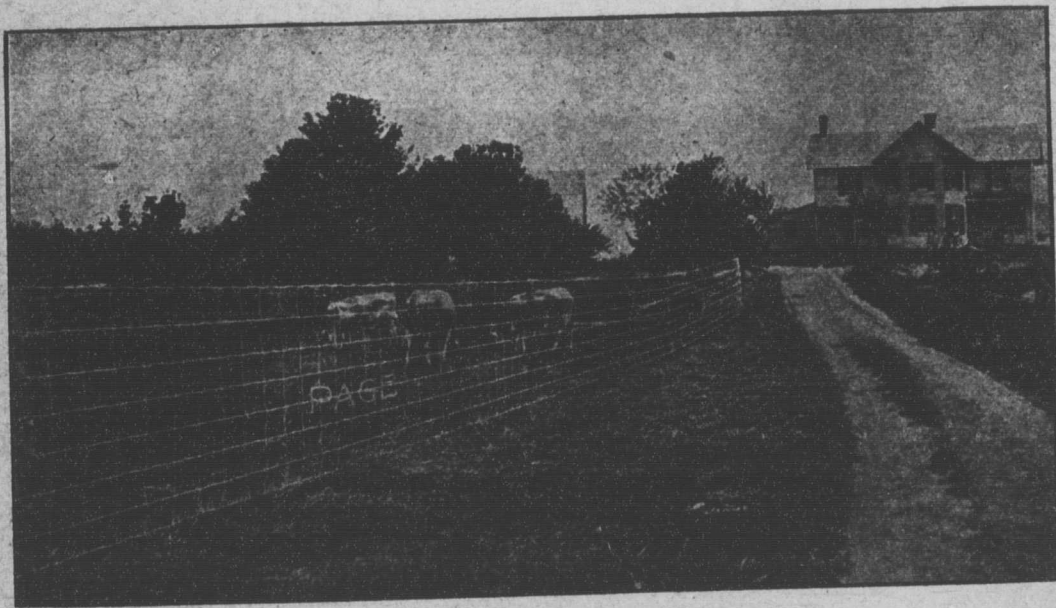
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(For publication in newspapers if found worthy.)

TENDENCIES OF THE KANSAS STATE AGRICULTURAL COLLEGE.

THE question has been asked as to the present tendencies of this institution. What should be its tendencies? The laws of congress endowing the land-grant colleges provide for a liberal and practical education for the industrial classes and specify instruction in agriculture, the English language, the mechanic arts, military tactics, and mathematical, physical, natural and economic science. Within two years the College has risen from one of the lowest to one of the highest rank in amount of agricultural instruction offered and received. It has established a dairy school, engaged in valuable experimental work, published pamphlet bulletins which have won the highest praise, and inaugurated a system of weekly press bulletins which have been widely copied. It has trebled the number of farmers' institutes, and divided their cost by three, and has received an institute appropriation which will enable it to visit every county in the state twice annually or more frequently. It has fired the students with an interest, hitherto unknown, in agriculture, and has so won the good will of the state as to secure for the agricultural department a legislative appropriation of \$34,000, against a biennial average since 1890 of one-seventieth of this amount. The Horticultural department, like the Agricultural and other departments, has performed experiments a single one of which would, if utilized, pay for the total cost of the College since its foundation in 1859.

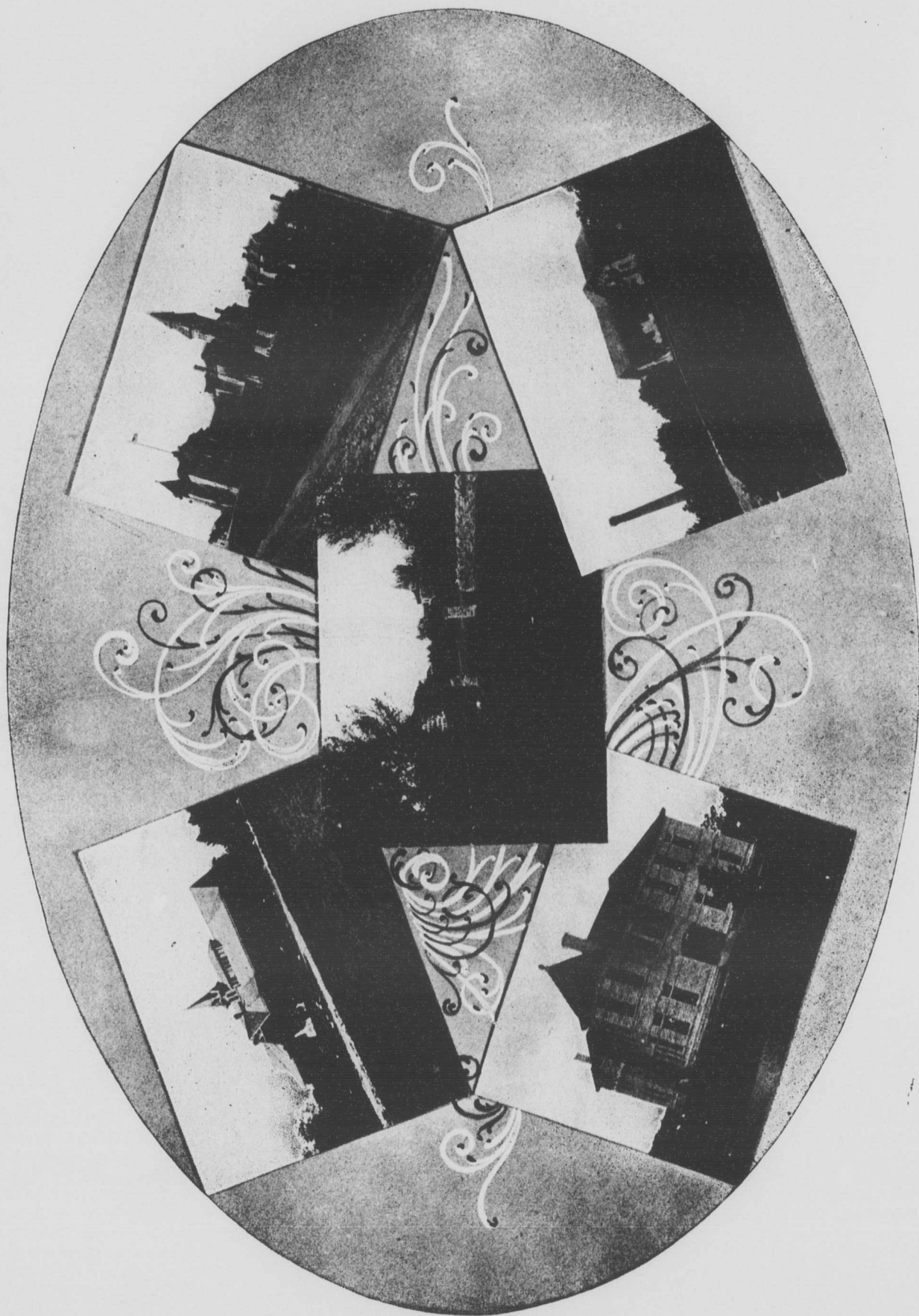
The Veterinary department has established a laboratory, experimented widely on practical lines, produced and distributed blackleg vaccine, whereby cattle raisers have saved many thousands of dollars; and, despite greatly increased college duties, has attended to the work of the state veterinarian.

The Mechanical department has risen from a mere manual training school to a high-grade department of mechanical engineering, has increased its attendance over 30 per cent and has then been compelled to turn students away; it has adopted an apprentice system popular with students and valuable educationally and pecuniarily to the department and College, and has received legislative appropriations eleven times greater than the average allowed this department since 1889-90.

The Domestic Science department has secured a building and earned a foremost place among similar departments west of the Alleghanies.

The departments of Agriculture, Mechanics and Domestic Science have each been given a special four years' course of study. These departments and the Horticultural department are prepared to offer short, highly practical courses next year to students able to attend but three months annually for two successive years.

The College has also increased the opportunity for study in history and economics with the view to preparing the student to perform intelligently the duties of citizenship. The attendance during the present year has surpassed that of all preceding years, as have the legislative appropriations.



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II. MUNICIPAL LIBERTY.*

BY FRANK PARSONS.

A FRANCHISE granted by the legislature to a city or town is not a contract. A franchise to establish, own and operate ferries, water-works, gas works, electric plants, street railways, etc., *is* a contract, if granted to an association of stockholders constituting a company, and is protected by the United States constitution; but is *not* a contract if granted to an association of individuals constituting a city, and is not protected by the federal constitution or anything else, but may be taken without compensation at the pleasure of the legislature, as was done in the case of the Hartford ferry. [See *East Hartford v. Hartford Bridge Co.*, 10 How. (U. S.) 511, sustaining the legislature on the broad ground that the grant of a ferry franchise to a municipality is not a contract. See also 77 Va. 214; but see contra 10 Barb. N. Y. 223.]

Not only are franchise grants to municipalities outside the protection afforded to contracts, but the whole city charter is denied such protection.

The charter of a private corporation is held to be a contract, and the legislature cannot alter it or repeal it, nor divide the company or consolidate it with another company without its assent, unless power to do it was expressly reserved. But, the powers and privileges of a city may be altered, abridged or annulled, and the city itself divided, annexed or abolished at the will of the legislature; (102 U. S. 511; Dillon §§ 54, 64, 85, 89). Imagine congress passing an act to annex Rhode Island to Connecticut, or to divide New York, or to declare that Illinois shall no longer be a state. Yet such an act enforced without assent of the states affected would be an act parallel with the arbitrary power possessed by many of our legislatures to divide a city or annex it to another, or declare its corporate existence at an end.

John Stuart Mill wrote on the Subjection of Women, and it is time some one wrote a book about the Subjection of Cities. The case is

* Continuation of the article under this title in the January INDUSTRIALIST.

worse in some respects with the cities than with the women—it has been some time since the law gave any person or persons the power to marry off a woman without her consent, much less divide her up, or discontinue her corporate existence.

THE REASONS FOR ALL THIS.

The reason sometimes given for the legislative power of strangling a municipality is that it was created by the legislature, and as the breath of life was breathed into it by the state authorities they have the right to withdraw the said breath at their pleasure. On similar grounds a parent would have a right to murder his child, and we should go back to the Roman plan of placing the power of life and death in the head of the family. Moreover private corporations as well as public are created by the legislature, and if creation confers a right of limitless modification even to dissolution in the one case, why not in the other? Finally, cities and towns are *not* created by the legislature. They may exist and frequently have existed without any legislature, and before there was any legislature. And their *existence* gives them the right of local self-government. People living together in the same locality have a right to associate themselves for the accomplishment of common purposes and to control their local affairs without dictation from distant cities and without permission from any legislature. The legislature may use cities and towns to accomplish state purposes and in that relation may properly mold their governments and functions, but has no more right to deprive them of freedom and self-control in local matters, than congress has to deprive a state of its freedom and self-control in internal concerns.

The real reason for the present state of municipal law appears to be the failure of the law, so far, to embody in its philosophy, with sufficient fulness and precision, the fundamental distinction between the functions of cities and towns as state agencies for enforcing state laws, and their functions as local business concerns. In England when the principles of the common law were crystallizing, the functions of municipalities were almost entirely confined to the first class, and the doctrine naturally grew up that municipalities were merely creatures of the state, doing a part of the state's work, and subject entirely to the state's orders—a doctrine fairly reasonable as long as municipal functions were confined to keeping order, attending to education and other state interests, but wholly inappro-

priate in reference to the ownership and management of water-works, gas works, electric light works, street railway systems, lodging houses, wharves, ferries, printing establishments, telephone exchanges, baths, and other local business enterprises that have crept into the municipal field, while the precedent-loving law has clung to the rule of former times, bending a little in the strong hands of two or three liberal courts, but with no due regard, as a rule, for the modifications required by the changes of modern life.

SOME LIMITATIONS ON THE LEGISLATURE.

In spite of the law's rigidity, however, and the powerful trend towards legislative absolutism in municipal affairs, some notches have been cut in this legislative omnipotence. (1) It is agreed that taxation must be for a public purpose, and the purpose must pertain to the district taxed; the legislature cannot tax even a city except within this rule. (2) The legislature cannot deprive a city of the *use* of its private property, such as water-works, gas plants, etc., nor compel it to convey such property, or part with the ownership of it, except upon due compensation. One of the best cases is *Mount Hope Cemetery v. Boston*, 158 Mass. 509, especially valuable because it was decided in a court that favors the doctrine of municipal dependence. The legislature ordered Boston to convey its cemetery property to the Mount Hope Cemetery Company, land, implements, everything. The court said:

The legislative power of control is not universal and does not extend to property acquired by a city or town for special purposes not deemed strictly and exclusively public and political, but in respect to which the city or town is deemed rather to have a right of private ownership of which it cannot be deprived against its will save by the right of eminent domain with compensation.

After commenting on the double character of the municipality, Judge Allen continues:

The cemetery falls within the class of property which the city owns in its private or proprietary character as a private corporation might own it, and its ownership is protected under the constitution of Massachusetts and of the United States so that the legislature has no power to require its transfer without compensation.

If the city has the right to *own* as private property why not the right to *manage and control* as private property. If the legislature cannot take the ownership, why should it be permitted to take the management and control of city property away from the city? Control is the very essence of ownership and often the only means

of obtaining any real benefit from the ownership. The judge goes on to speak of other property held by the city of Boston as private property:

Its system of water-works, its system of parks, its markets, its hospital, and its library. In establishing all these, the city has not acted strictly as an agent of the state government for the accomplishment of general public or political purposes, but with special reference to the benefit of its own inhabitants.

Even if a city or town is abolished, such property rights are not destroyed, but go to the state in trust for the inhabitants of the municipal area. Some cases go so far as to protect all property of municipal corporations, whether used for private or local purposes, or for public or state purposes, such as school, military, political, or government uses. See 22 Wis. 660; 54 N. H. 38, 56; 54 Tex. 153. But the general doctrine is that the public property of municipal corporations, city halls, court houses, school buildings, police and military property, etc., is absolutely at the disposal of the legislature (Dillon, chaps. iv and v). And, so high an authority as Chief Justice Denio has been quoted in support of the doctrine that municipal corporations are altogether public, mere agencies of the state, subject to absolute and unlimited control by the legislature, and their property, tho held for income or sale, and not connected with any governmental use, is not within the provisions of the constitution protecting private property, and may be taken by the legislature without compensation. (Darlington v. Mayor, 31 N. Y., 164.) When the facts of this case are examined, however, the remarks of the chief justice in this connection appear to be mere dicta. The act under consideration simply made city property liable for claims against the city for not keeping the peace, which it is its duty to do. The legislature can make the private property of individuals liable for claims on account of non-fulfilment of any duty due from those individuals.

INHERENT RIGHT TO SELF-GOVERNMENT.

A few cases hold that municipalities cannot be deprived of the *management* of their property held for income or local business—that upon the fundamental principles involved in free institutions, cities and towns have an *inherent right* to control such private property, and manage their local affairs, and that the legislature cannot deprive them of the right to select the officials who are to control and manage said property and affairs.

In *People v. Hurlbut*, 24 Mich. 44 to 114 (1871) the court decided that the legislature could not appoint a board of public works to

control the public buildings, pavements, sewers, water-works, engine houses, etc., in the city of Detroit, altho no express provision of the constitution negatived the act. Chief Justice Campbell and Justices Cooley and Christiancy gave the matter great consideration and rendered separate opinions all based upon the principle that local self-government of local affairs is an essential part of our system.

The history of the "country, and the nature of our institutions" show "the vital importance which in all the states has so long been attached to local municipal governments by the people of such localities, and their rights of self-government."

Chief Justice Campbell distinguishes (*People v. Mahaney*, 13 Mich. 492,) where the validity of an act establishing state control of city police is sustained, saying the question was "whether the police board is a state or municipal agency," and added:

I think it is clearly an agency of the state government. . . . There is a clear distinction in principle between what concerns the state and that which does not concern more than one locality. . . . There is no dispute concerning the character of the public works act. Its purposes are directly and evidently local and municipal.

He decided that the municipality could not be deprived of the right to choose the men who should manage its public works. He said:

Our constitution cannot be understood or carried out at all, except on the theory of local self-government. . . . The confusion existing on this subject has arisen from the custom prevalent under all free governments of localizing all matters of public management as far as possible, and of making use of local corporate agencies whenever it can be done profitably, not only in local government but also for purposes of state. (Pp. 81, 84, 89.)

Judge Cooley made an extensive review of the pertinent historic facts and general principles, and concluded against the "legislative power to appoint for municipalities the officers who are to manage the property, interests and rights in which their own people are alone concerned." He further said:

The municipality as an agent of government is one thing; the corporation as an owner of property is, in some particulars, to be regarded in a very different light. . . . In the case before us, the offices in question involve the custody, care, management and control of the pavements, sewers and water-works, and public buildings of the city, and the duties are purely local. The state at large may have an interest in an intelligent, honest, upright, and prompt discharge of them, but this is on commercial and neighborhood grounds, rather than political. (Pp. 103, 104, 105.)

In *Board of Park Commissioners v. Detroit*, 28 Mich. 228 (1873), where the legislature appointed state officers to buy land and im-

prove it for a park for, and at the expense of, the city of Detroit, Judge Cooley said:

We affirm that the city of Detroit has the right to decide for itself upon the purchase of a public park. . . . It is as easy to justify, on principle, a law which permits the rest of the community to dictate to an individual what he shall eat, and what he shall drink, and what he shall wear, as to show any constitutional basis for one under which the people of other parts of the state dictate to the city of Detroit what fountains shall be erected at its expense for the use of its citizens, or at what cost it shall purchase, and how it shall improve and embellish, a park or boulevard for the recreation and enjoyment of its citizens. (Pp. 241, 242.)

A passage from the opinion of the same judge in the former case, 24 Mich. '97, is interesting in connection with the last quotation. Says the learned judge:

The doctrine that within any general grant of legislative power by the constitution there can be found authority thus to take from the people the management of their local concerns, and the choice directly or indirectly of their local officers, if practically asserted, would be somewhat startling to our people, and would be likely to lead hereafter to a more careful scrutiny of the charters of government framed by them lest sometime, by an inadvertent use of words, they might be found to have conferred upon some agency of their own the legal authority to take away their liberties altogether.

The Michigan constitution says, Art. xv, §14:

Judicial officers of cities and villages shall be elected, and all other officers shall be elected or appointed, at such time and in such manner, as the legislature may direct.

But the Michigan judges hold that in the light of history, and fundamental principle, the election or appointment of municipal officers proper must be by local authority in such time and manner as the legislature may direct.

In *State v. Denny*, 118 Ind. 382 (1888) an act creating a board of public works to be appointed by the legislature, and to have control over streets, alleys, sewers, water-works, and lights, was held invalid as infringing the right of local self-government inherent in municipal corporations under our system of free institutions. The right of local self-government antedated the constitution, and was not surrendered by it. Says Judge Coffey, citing Cooley on Constitutional Limitations, 5th ed. page 208:

It does not follow that in every case the courts, before they can set aside a law as invalid, must be able to find in the constitution some specific inhibition which has been disregarded. . . . If the authority to do an act has not been granted by the sovereign to its representatives, it cannot be necessary to prohibit its being done. (Pp. 394-95.)

The court continues:

The constitution must be considered in the light of the local and state governments existing at the time of its adoption. . . . The principles of local self-government constitute a prominent feature in both the federal and state governments. . . . It existed before the creation of any of our constitutions, national or state, and all of them must be deemed to have been formed in reference to it, whether expressly recognized in them or not. . . . The object of granting to the people of a city municipal powers is to give them additional rights and powers to better enable them to govern themselves, and not to take away any rights they possessed before such grant was made. It may be true that as to such matters as the state has a peculiar interest in, not differing from that relating to other communities, it may, by proper legislative action, take control of such interests, but as to such matters as are purely local, and concern only the people of that community, they have the right to control them, subject only to the general laws of the state which affect all the people of the state alike. The construction of sewers in a city, the supply of gas, water, fire protection, and many other matters that might be mentioned, are matters in which the local community alone are concerned, and in which the state has no special interest more than it has in the health and prosperity of the people generally, and they are matters over which the people affected thereby have the exclusive control, and it cannot, in our opinion, be taken away from them by the legislature.

In *Evansville v. State*, 118 Ind. 426 (1888) it was held that an act placing the police and fire departments of certain cities, and the property connected therewith, together with the purchase of supplies, under the exclusive control of commissioners to be selected by the legislature, was void, as being a denial of the right of local self-government. The court says that securing an efficient police department is a state purpose, but the remainder of the act dealt with purely local purposes. (P. 437.)

These rulings as to the inherent right of local election of officers and management of property guarantee self-government within the sphere of local business permitted by the charter, but the charter itself is subject to limitation or repeal at the will of the legislature, and there is at best no power of initiating a business or policy beyond the foreordained enumeration of the charter. Moreover, the courts that take such a position are few. The majority hold with 7 *Houston* 44, and 44 *Oh. st.* 343 that the legislature may take city water-works, etc., out of the hands of the cities and put them under the control of state officers and boards. The reasoning by which this course is sustained is well expressed in 148 *Mass.* 375 at 383-6:

It is suggested, tho not much insisted on, that the statute of 1855, c. 323, is unconstitutional, because it takes from the city the power of self-government in matters of internal policy. We find no provision in the constitution with which it conflicts, and we cannot declare an act of the legislature invalid because it

abridges the exercise of the privilege of local self-government in a particular in regard to which such privilege is not guaranteed by any provision of the constitution.

The court then referred to constitutional provisions to make "wholesome regulations," to "erect municipalities," "grant powers," etc. The constitution did not say the legislature could take away powers once granted but this was held to be the case by the court which continued as follows:

Under these provisions, as is said by C. J. Chapman: "There can be no doubt that the power to create, change and destroy municipal corporations is in the legislature. *This power has been so long and so frequently exercised upon counties, towns and school districts, in dividing them, altering their boundary lines, increasing and diminishing their powers, and in abolishing some of them, that no authorities need be cited on this point.* The constitution does not establish these corporations, but vests in the legislature a general jurisdiction over the subject by its grant of power to make wholesome laws, as it shall judge to be for the general good and welfare of the commonwealth." It "may amend these charters, enlarge or diminish their powers, extend or limit their boundaries, consolidate two or more into one, and abolish them altogether, at its own discretion."

We have no doubt that the legislature has the right in its discretion to change the powers and duties created by itself, and to vest such powers and duties in officers appointed by the governor . . . instead of leaving such officers to be elected by the people, or appointed by the municipal authorities.

The law under consideration in this case established a state police for Boston, and so was not within the limits of the Michigan and Indiana decisions, but the reason covered the whole field and is often referred to as authority against the Michigan doctrine.

THE GENERAL SITUATION.

In some states, constitutional provisions have been adopted securing more or less municipal freedom as a right, and as a matter of fact our legislatures accord municipalities a considerable degree of self-control, tho only as a courtesy liable to recall at the pleasure of the legislature, except where the Michigan doctrine obtains, or the constitutional provisions just mentioned interfere with state absolutism. Upon the whole, the situation appears to be this:

1. Cities have no independent initiative of their own. They belong to the defective and dependent classes. They are creatures of enumerated powers, which are for the most part strictly construed.* If they want to go out of doors they must ask the legislature.

*A municipal corporation can exercise no powers except those granted to it in express words, or necessarily or fairly implied in or incident to the powers expressed, or indispensable to the declared objects and purposes of the corporation, and "any reasonable doubt concerning the existence of the power is resolved by the courts against the municipal corporation, and the power is denied." Von Schmidt v. Widber. 105 Cal. 151, 157.

2. They have as a rule no recognized right to choose their own officers.

3. They have as a rule no recognized right to control and manage their property.

4. They have no recognized right to continue in existence—no recognized right to life, liberty or the pursuit of happiness. I say no *recognized* right, because I believe they *have a right* to life and property and self-government, but it is not generally recognized as yet.

5. Neither a franchise grant, nor the charter as a whole is regarded as a contract or within the protection of the federal constitution.

6. Even cities, however, cannot be taxed except for a public purpose, and one that pertains to the district taxed.

7. The people in the municipal area have a right to the *use* of the business property of the municipality and perhaps of its public property also.

8. Some courts recognize an inherent right in municipalities to control their business property and manage their local affairs, and elect their own officers to exercise such control and management.

9. As a matter of fact, considerable local self-control exists by legislative *permission*.

10. In some states the prevailing rules of law as to municipal subjection have been altered by constitutional provision, and there is a strong movement of thought in favor of such modification.



CONTRIBUTIONS TO THE KNOWLEDGE OF THE COCCIDÆ.

BY T. D. A. COCKERELL AND P. J. PARROTT.

(Concluded from last month.)

IX. *A green Mytilaspis.*

Mytilaspis concolor (Ckll.) var. *viridissima*, Ckll. & Parrott, n. var. Scales of both sexes emerald green, often very bright. Female dark purple (turning green in caustic soda), with a bright yellow patch in the anal region, and suffused crimson spots at intervals round the margins of the hind end. *Hab.*—Campus of Agricultural College, Mesilla Park, N. M., Feb. 5, 1899 (P. J. Parrott). On bases of stems of *Atriplex canescens*. A very interesting variety, having the purple pigment of the female converted to green (its alkaline phase) in the scale.

X. *Some species from Oregon.*

The following species, collected in Oregon, were received from Prof. A. B. Cordley sometime ago:

1. *Aspidiotus hederæ* (Vallot) Signoret. (Cordley, No. 4.)
2. *A. hederæ* var. *carpodeti* (Mask.) n. comb. On oleander, Pandelon, Oregon, April 20, 1897. (Cordley, No. 7.) This is a variety with a convex scale and covered exuviae, and large median lobes; we believe it must be referred to *carpodeti*. It is new to America.
3. *A. britannicus*, Newstead, 1898. (*Aspidiotus* n. sp., Ckll., Bull. 6, Tech. Ser., Div. Ent., Dept. Agric., 1897, p. 12, fig. 9, the figure being original, from material supplied by Newstead, not "after Newstead," as it was labeled without the author's knowledge.) On leaves of holly, Salem, Oregon, April 11, 1898. (Cordley, No. 11.) New to America; previously only found in England.
4. *Aspidiotus abietis* (Schr.) Löw. Apparently on pine needles. The Dalles, May 5, 1896. (Cordley, No. 1.) New to the West.
5. *Aspidiotus perniciosus*, Comst. (Cordley, No. 6.)
6. *Chrysomphalus ficus*, Ashm. Corvallis (doubtless in a hothouse); Oct. 15 1896. (Cordley, No. 3.)
7. *Diaspis carueli*, Targ. On *Juniperus*. Corvallis, July 20, 1896. (Cordley, No. 2.)

XI. *Some Miscellaneous Records.*

1. *Lecanium tessellatum* var. *perforatum* (Newst.) In a greenhouse at Ames, Iowa, on *Howea belmoreana* and *Trachycarpus excelsus*, Jan. 25, 1899. (W. Newell.) This is an addition to the Iowa list.
2. *Lecanium coffeæ*, Walker. On *Cycas revoluta* in a greenhouse at Ames, Iowa; Jan. 25, 1899. (W. Newell.)
3. *Aulacaspis elegans* (Leon.) Ckll. On *Cycas revoluta* in Massachusetts, which was imported last year from Bermuda. (G. B. King.) Previously only known from Italy.
4. *Diaspis amygdali*, Tryon. On *Cycas revoluta* from Japan. (A.

Craw.); on peach and *Celtis*, Campinas, Brazil. (F. Noack.) 5. *D. calyptroides* var. *opuntiae* (Ckll.). Sierra Blanca, Texas, on *Opuntia arborescens*, May 28, 1898, (C. H. T. Townsend). The variety is new to the United States. The grouped glands were as follows: median, 11; anterior laterals, 23; posterior laterals, 13. 6. *Fiorinia floriniae* (Targ.) Ckll. On leaf of camellia, Campinas, Brazil, 1898. (F. Noack, No. 1.) 7. *Pseudoparlatoria noacki*, Ckll. On *Nectandra*, Campinas, Brazil, (F. Noack). 8. *Aspidiotus maskelli*, Ckll. On twigs of camellia. Campinas, Brazil, 1898. (F. Noack.) 9. *Aspidiotus crawii*, Ckll. On *Hedera* in hothouse, Lawrence, Mass. (G. B. King). Previously only known from Mexico. 10. *Aspidiotus convexus*, Comst. El Paso, Texas, on twigs of *Melia azedarach*, May 3, 1898, (C. H. T. Townsend). 11. *Aspidiotus cydoniae*, Comst. On *Prosopis juliflora* var., Kenedy, Texas, May 31, 1898, (C. H. T. Townsend). 12. *Aspidiotus greenii*, Ckll. On guava, Campinas, Brazil, (F. Noack); on vine leaves, Itapirano, Mattodentro, (Dr. Brunnemann; com. F. Noack).

XII. *A new Aspidiotus from New Mexico.*

Aspidiotus (Targionia) *gutierreziae*, Ckll. & Parrott, n. sp. Female scale $1\frac{1}{3}$ to $1\frac{1}{2}$ mm. diameter, subcircular, slightly convex, with a thick ventral scale, the margins of which are free and somewhat elevated, so that the whole scale resembles an oyster shell as in *A. cueroensis*. Color of scale snow white; exuviae marginal covered by a delicate film, often rubbed off, exposing the shining straw-yellow first skin. Living female plump, rather dull amber yellow, speckled with reddish brown about the lateral margins. Female of the usual shape; caudal portion remaining strongly brown after boiling in caustic alkali; no grouped circumgenital glands, but in their place are chitinous thickenings, as in *cueroensis*; anal orifice rather distant from the hind end; two large contiguous median lobes, almost square, with truncate ends, the outer corner rounded and depressed; second and third lobes represented by short tooth-like processes, the inner sides of which are practically perpendicular, and the long outer sides gently sloping; spines quite large; plates almost obsolete, but there are two pointed ones in the first interlobular interval; dorsal glands numerous, quite small, round. Male scale pure white, elongated with parallel sides, as in *Diaspis*, but rather short; about four-fifths mm. long, hardly two-fifths mm. broad; the anterior portion convex, the hind portion flat, with no trace of a keel; exuvia entirely covered.

Hab.—On stems of *Gutierrezia iucida*, Greene, near the Agricul-

tural College, Mesilla Valley, New Mexico, March 2, 1899, (P. J. Parrott). Allied to *A. cueroensis* which must also go in *Targionia*. The male scale, with its covered exuvia, is quite peculiar. *Gutierrezia lucida* is the common species of the Mesilla Valley, hitherto reported (Proc. Phila. Acad., 1896, p. 35, etc.) as *G. sarothræ* var. *microcephala*. The commonest Coccid on it is *Dactylopius gutierreziae*. It may be as well to record the breeding of *Aphycus texanus*, Howard, from this *Dactylopius*, the specimens having been collected, Sept. 27, on the mesa east of Las Cruces, by Cockerell. The *Aphycus* is a minute lemon yellow species, with the tip of the ovipositor black; the front is very distinctly tessellate; the mandibles are brown at tips, and notched within. The Mesilla valley examples had been described in MS. as a new species, but Dr. Howard stated that they belonged to his *A. texanus*, then unpublished.

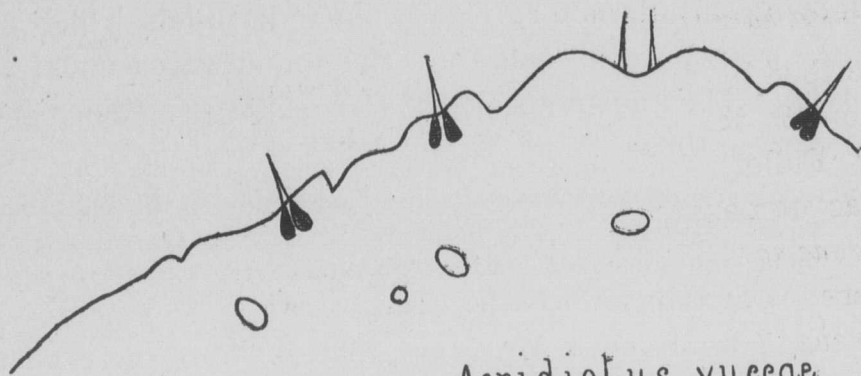
Accompanying this account of *Aspidiotus gutierreziae*, we have thought it expedient to present figures, not only of the new species, but also of a number of other North American forms without circumgenital glands, which are more or less closely allied to it, namely *A. cueroensis*, *coniferarum*, *yuccæ* and var. *neomexicanus*, *yuccarum*, *bigeloviae* and *dearnessi*. *A. cueroensis*, as first described, showed no squames, but they are well seen in the example figured, which is from the original lot. It must be that they are easily deciduous. The variety of *A. yuccæ* is herewith described:

Aspidiotus yuccæ var. *neomexicanus*, Ckll. & Parrott, n. var. (*Aspidiotus yuccæ*, var., Ckll., Ann. Mag. Nat. Hist., July, 1898, p. 25). Median lobes more produced; notched on each side. Hab.—On *Yucca elata*, Mesilla Valley, New Mexico, 1898, (C. H. T. Townsend).

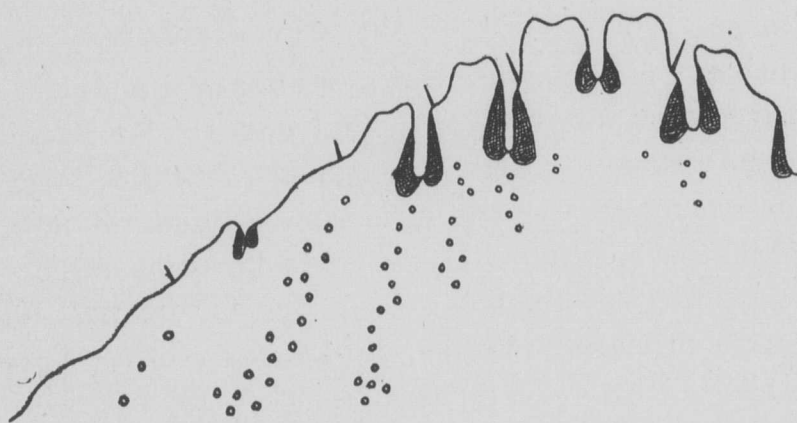
It may also be stated here that *A. yuccarum* was lately found by Parrott at Mesilla Park, N. M., at the base of the stems of *Isocoma heterophylla* var. *wrightii* (*Linosyris wrightii*, Gray, Pl. Wright i, 95; *Bigelovia wrightii*, Gray, Syn. Flora, vol. I. pt. 2, p. 142). This is a new and unexpected food-plant.

XIII. *Gymnaspis perpusilla* (Maskell).

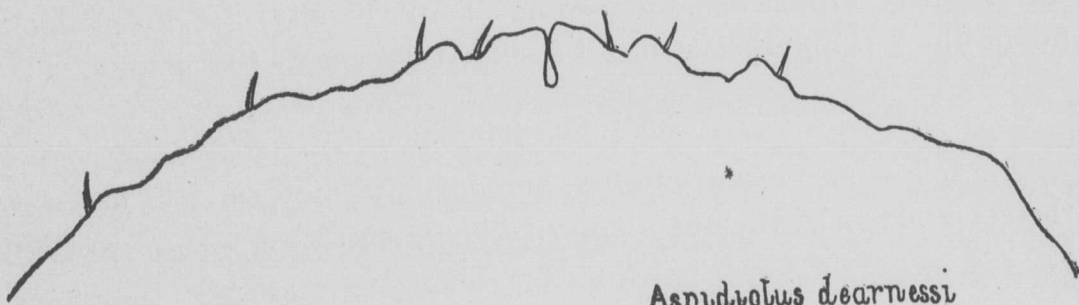
Mr. C. Fuller was so kind as to send us some specimens of *Parlatoria perpusilla*, Maskell, Trans. N. Z. Inst. XXIX, 299, from Western Australia. As the insect was evidently not a *Parlatoria*, we examined it with much interest, and found it to belong to Newstead's genus *Gymnaspis*. Maskell's figure 9 is from the immature stage; the caudal end of the adult female, closely resembling *Xanthophthalma*,



Aspidiotus yuccae



Aspidiotus yuccarum



Aspidiotus dearnessi

is figured herewith. New figures are also given of the scale, those of Maskell being unsatisfactory. Only the individuals which have not formed the scanty white scale show the double cap, consisting of the two exuviae. The known species of *Gymnaspis* are easily separated by their scales, thus:

- A. Female scale (really second skin) from a dark brown to shining bronzy black.
 - a. Caudal extremity usually pointed *G. æchmeæ*, Newstead
 - b. Caudal half narrowed, flattened, produced *G. bullata*, (Green)
- B. Female scale (really second skin) orange brown... *G. perpusilla* (Maskell)

Newstead's figure (Ent. Mo. Mag., 1898, p. 93) of the caudal end of *G. æchmeæ* resembles Green's figure of the margin of the second pellicle of *G. bullata*. The original habitat of *G. æchmeæ* is not known; it was found in Kew Gardens, England, on *Æchmea aquilega*, Griseb., which is a Bromeliaceous plant native of the West Indies.

XIV. *Lichtensia hakearum* (Fuller).

This was very briefly described by Fuller as a doubtful *Lecaniodiaspis*, but it has nothing to do with that genus. We have examined material kindly sent by Mr. Fuller, and place the insect for the present in *Lichtensia*. It has numerous tubular glands after the manner of *Mallococcus* and *Ceronema*. The legs and antennæ measure as follows in micromillimeters: Legs—coxa, 182-231; femur with trochanter, 265; tibia, 182; tarsus, 115-123; claw, 33. Antennal segments—(1) 84-112, (2) 56-70, (3) 64-98, (4) 93-98, (5) 22-28, (6) 17-22, (7) 40-42.

XV. *Eriochiton cajani*, Maskell.

The following measurements in micromillimeters, are from specimens received from Mr. Maskell: Legs—coxa, 93-101; femur with trochanter, 98-140; tibia, 70-101; tarsus, 64-70; claw, 12. Antennal segments—(1) 34-39, (2) 28-31, (3) 28-36, (4) 28-36, (5) 20-22, (6) 17-20, (7) 15-20, (8) 17-20. We found always eight antennal segments, altho Maskell says there are but seven. Superficially, the insect looks much like a *Ceroplastodes*, but it does not belong to that genus.

XVI. *Pulvinaria*.

The following measurements, in micromillimeters, will assist in the recognition of various forms of *Pulvinaria*:

ANTENNAL SEGMENTS.

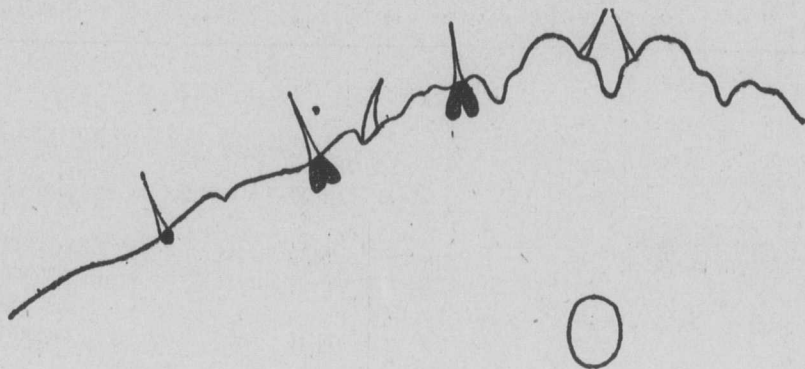
| FORMS. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|-------|-------|-------|-------|-------|-------|-------------|------------|
| <i>P. innumerabilis</i> , Rathv. Lincoln, Nebraska, on <i>Acer negundo</i> . (L. Bruner.) | 42-47 | 42-45 | 67-70 | 60-53 | 31-39 | 25 | 19 | 40-42 |
| <i>P. innumerabilis</i> on Virginia creeper, San Juan, N. M. (A. Boyle.) | 47 | 42 | 78 | 45 | 33 | 28 | 17 | 56 |
| <i>P. innumerabilis</i> var. <i>occidentalis</i> , Ckll. Part of type lot, Wash. state | 70 | 56 | 81-95 | 70-76 | 53-67 | 33-53 | 28-33 | 42-56 |
| <i>P. innumerabilis</i> var. San Antonio, Texas, on <i>Celtis</i> . (C. H. T. Townsend.) | 40 | 42 | 59 | 47 | 37 | 25 | 22 | 48 |
| <i>P. amygdali</i> , Ckll., Pinos Altos, N. M. Type lot, but antenna abnormal | 33? | 70? | 50 | 31 | 23-26 | 20 | 47 | — |
| <i>P. urbicola</i> , Ckll. Kingston, Jamaica. Topotypes | 33-42 | 42-50 | 56-62 | 36-42 | 33-47 | 20-28 | 42 17-20 | — 22-25 |
| <i>P. marmorata</i> , Ckll. Organ Mts., N. M. Type | 47-56 | 49-56 | 61-64 | 56 | 31-37 | 28 | 19 | 39 |
| <i>P. bigeloviae</i> , Ckll. Grand Junction, Colo. (Gillette.) | 50 | 47-56 | 73 | 68-70 | 42-45 | 28 | 20-23 | 28 |

LEGS.

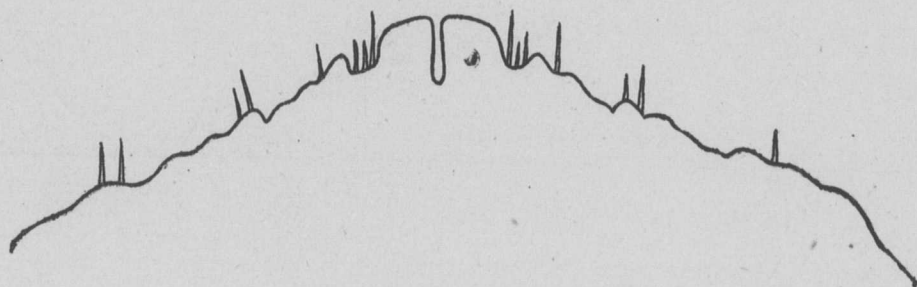
| FORMS. | Coxa. | Femur and trochanter | Tibia. | Tarsus. | Claw. |
|--|---------|----------------------|---------|---------|-------|
| <i>P. innumerabilis</i> , Rathv. Lincoln, Nebraska, on <i>Acer negundo</i> . (L. Bruner.) | 132 | 198 | 165 | 90 | 16 |
| <i>P. innumerabilis</i> on Virginia creeper, San Juan, N. M. (A. Boyle.) | 82-115 | 198-215 | 165-182 | 90 | 20 |
| <i>P. innumerabilis</i> var. <i>occidentalis</i> , Ckll., Part of type lot, Wash. state | 132-182 | 215-281 | 163-165 | 82-99 | 16-24 |
| <i>P. innumerabilis</i> , var. San Antonio, Texas, on <i>Celtis</i> . (C. H. T. Townsend.) | 110 | 174 | 133 | 83 | |
| <i>P. amygdali</i> , Ckll., Pinos Altos, N. M., Type lot, but antenna abnormal | 149-165 | 231-248 | 182-198 | 90-99 | 17-24 |
| <i>P. urbicola</i> , Ckll., Kingston, Jamaica, Topotypes | 149-165 | 198-223 | 132-149 | 74-85 | 23-24 |
| <i>P. marmorata</i> , Ckll. Organ Mts., N. M., Type | 165-215 | 331-347 | 215-231 | 123-132 | 41-45 |
| <i>P. bigeloviae</i> , Ckll. Grand Junction, Colo. (Gillette.) | 215-231 | 347-364 | 248 | 132 | 41-49 |

XVII. *Icerya rileyi*, Ckll.

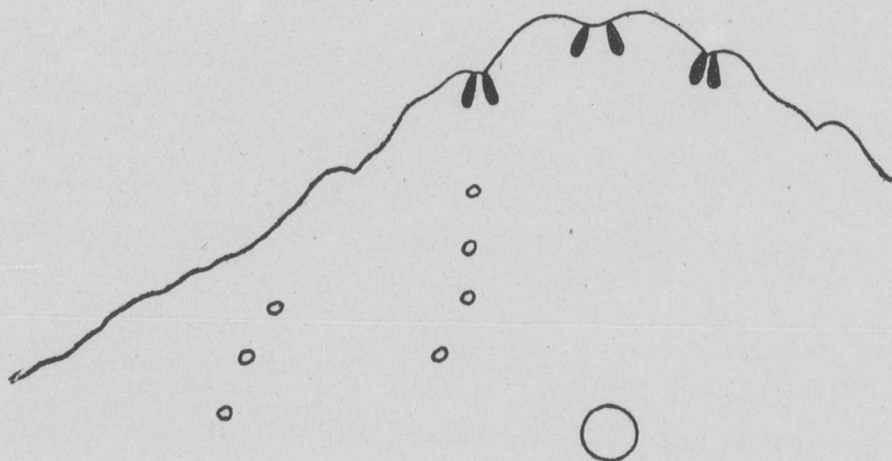
This insect is common at Mesilla Park, N. M., on *Larrea* and mesquite. It has been thought possible that the forms on these very different plants might be separable, and to test this, an experiment was made. On May 24, 1898, a lot of eggs and young larvæ were transferred from a *Larrea* to a mesquite, to see if they would survive the change. It may have been an accidental circumstance that none



A. yuccae var. *neomexicanus*



Aspidiotus gutierreziae



Aspidiotus bigeloviae

lived, but a later examination showed no traces of them. On the other hand, a new examination of specimens from both plants (using some material collected at Las Cruces by Professor Townsend) shows that their legs and antennæ are practically the same. In both lots the antennæ varied from nine to ten segments, and both showed the fourth segment divided by quite a distinct suture, so that it would be possible to regard it as consisting of two segments. The following measurements are in micromillimeters:

ANTENNAL SEGMENTS.

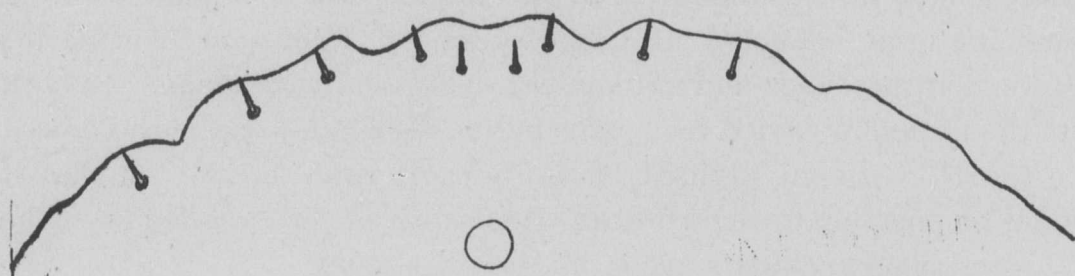
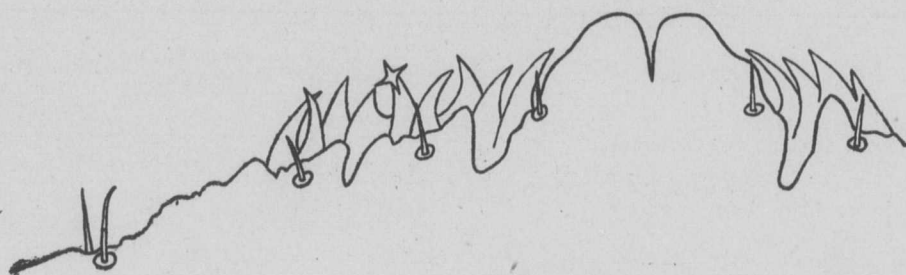
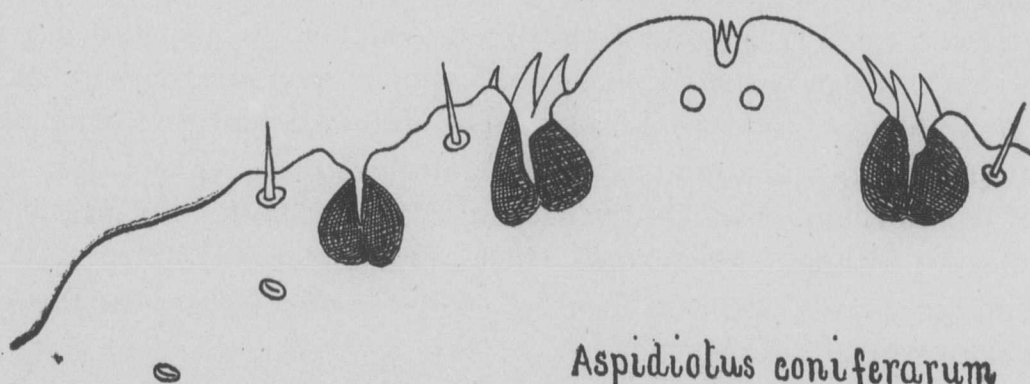
| FORMS. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--|------------|-----------|-----------|----------|----------|-------------|----------|----------|-----------|----------|
| <i>I. rileyi</i> from <i>Larrea</i> . Adult female. | 116 133 | 99 116 | 99 99 | 83 99 | 83 50 | 66 50 | 50 57 | 50 57 | 149 57 | — 149 |
| <i>I. rileyi</i> from mesquite..... | 116 116 | 99 99 | 99 107 | 83 58 | 83 41 | 74 91-99 | 69 66 | 50 58 | 149 58 | — 149 |
| <i>I. rileyi</i> , larva from mesquite... | 42 | 47 | 53-56 | 42 | 28-36 | 81 | — | — | — | — |

LEGS.

| FORMS. | Coxa. | Femur and trochanter | Tibia. | Tarsus. | Claw |
|---|------------|--------------------------|------------|------------|----------|
| <i>I. rileyi</i> from <i>Larrea</i> . Adult female..... | 331 115 | 612 by 248 612 by 248 | 546 562 | 314 248 | 74 49 |
| <i>I. rileyi</i> , larva from mesquite..... | 58 66 | 182 199 | 166 182 | 133 141 | 25 25 |

Chloroform turns the white ovisacs of this species bright yellow; this color disappears when the chloroform evaporates.

There is a Coccinellid beetle, not hitherto recognized in the U. S. fauna, which is rather common at Mesilla Park, always preying on *Icerya rileyi*. It is 3 mm. long, broad oval, convex, black, hoary with a short pale pubescence, moderately shiny; each elytron with an oval dark red spot, and a broad red upper external margin. The under surface, legs and antennæ, are dark, dull reddish. According to Mr. H. S. Gorham, who kindly examined a specimen, this beetle is a *Cnoodes*, either *C. bipunctatus*, Gorh., or very closely allied to it. A similar species preys on *Crypticerya townsendi*, Ckll., near the Mes-calero Agency, N. M.

*Gymnaspis perpusilla*♀ scale of *G. perpusilla**Aspidiotus cueroensis**Aspidiotus coniferarum*

RILEY COUNTY REAL ESTATE MORTGAGES.

BY R. S. KELLOGG.

RILEY COUNTY is in the northeastern part of the state of Kansas. The Blue river forms its eastern boundary, and its southern portion is crossed by the Kaw. Manhattan, the largest town and the county seat, is at the junction of these two streams and has a population of about 3000.

The area of the county is 617 square miles, or 394,880 acres. Its population is 12,453. The assessed valuation of property for the year 1898 is as follows:

| | |
|----------------|-----------------------|
| Land..... | \$1,709,265.00 |
| City lots..... | 385,106.00 |
| Personal..... | 556,810.00 |
| Railways..... | 708,169.00 |
| Total..... | <u>\$3,359,350.00</u> |

The average assessed valuation of the land for the past six years has been \$1,702,542.25. The assessed valuation is commonly estimated to be one-third of the true valuation.

The average number of acres under cultivation for the past six years has been 171,867. For the same period the average yearly value of all farm products, including cattle slaughtered and sold for slaughter was \$1,689,434.46. It will be noticed that this amount is nearly the same as the assessed valuation of the land—a fact which should indicate a fair degree of prosperity.

There are many intelligent, progressive farmers in the county, and presumably it is as favorably situated for agricultural pursuits as the average county in the eastern third of the state.

Under these circumstances a few facts concerning the mortgage indebtedness are of interest, and certainly more satisfactory than the frequent theorizings on the subject which are not based on careful investigation. Accordingly the books of the register of deeds were examined with two principal objects in view: (1) to obtain statistics concerning the releasing of mortgages, (2) to determine the total amount filed for several years past.

Table No. 1 was prepared for the first purpose. The 180 cases investigated for the years named, are, of course, but a small fraction of the total number filed during that period, but every effort was made to make them representative. They were taken in alphabetical order as recorded in the general mortgage index of the county, and

omissions made only when the record was incomplete, or when some minor mortgage was evidently given for interest or commission on another of larger amount. If no release was recorded, of course the assumption had to be made that the mortgage was yet unpaid. As the registry laws of the state are quite strict, this can be no great source of error, if any at all.

If a release was recorded, then the search was continued to determine whether a sale of the property had been in any way connected with it, or if a new mortgage had been made at about the time of the release, or subsequently. The figures for this table were nearly all taken during the months of October and November, 1898.

A perusal of this table will make the meaning of its terms evident. Of 180 mortgages recorded in the years given, 64 were found to be yet standing, and 116 had been released in various ways. Under the heading "Sale involved" are grouped all cases in which a sale of the property took place at about the time of the release, or previous to it, and payment assumed by either buyer or seller. No claim is made that for a number of cases under this head, the sale was the actual cause of payment, but only that it was a possible or probable one. Under the heading "Remortgaged" are given the cases in which the release was followed by a new mortgage, also the amount in both cases and the per cent of increase. The heading "Paid straight" means that no evidence of sale or remortgaging could be found. The average duration of a mortgage with the number of cases upon which it is based complete the table. This period would be lengthened were it known when those still standing would be paid, and their time included. These mortgages were on both farm and town property, tho mostly on the former.

The totals give some interesting facts. Of the 180 mortgages taken from the years 1890, '91, '92 and '93, amounting to \$132,031.10 and averaging \$733.51 each, 64 or 35% were found to be still standing. A sale was apparently involved in some way with the release of 21 or 12%. New mortgages had been given for 50 or 28%, while their original amount of \$36,583.00 was replaced by one of \$43,992.50 showing a 20% increase of indebtedness. The cases of actual foreclosure and sale by judicial order were only 5 or 3%. Foreclosure is sometimes avoided by the deeding of the property to the mortgagee. The cases of straight payment numbered 40 or 22%. The average time on 111 mortgages was 3.67 years, or practically three years and eight months.

It was impossible to make this last computation really accurate because of the fact that the filing of the release is often quite a time after the release is actually made. It is, however, a very fair approximation, probably within a few days, as in numerous cases the recording of the release was made by copying the endorsement on the original instrument, or the entering of a receipt upon the margin of the record. It may be remarked here that a recent law compels the mortgagee to have the release recorded within thirty days of the date of payment, if the mortgagor demands it, and without expense to the latter. A failure to comply with this demand renders the mortgagee liable to a heavy fine, and also to a claim for damage, should any result from his inaction.

| TABLE NUMBER TWO—RELEASED. | | | | | | | | |
|----------------------------|----------------|----|--------------|----|-------------|---|---------------|----|
| No. | Sale involved. | | Remortgaged. | | Foreclosed. | | P'd straight. | |
| | No. | % | No. | % | No. | % | No. | % |
| 116 | 21 | 18 | 50 | 43 | 5 | 4 | 40 | 35 |

In table No. 1, 180 is used as the base for figuring the percentages. In table No. 2, 116, the number released, is used as the base.

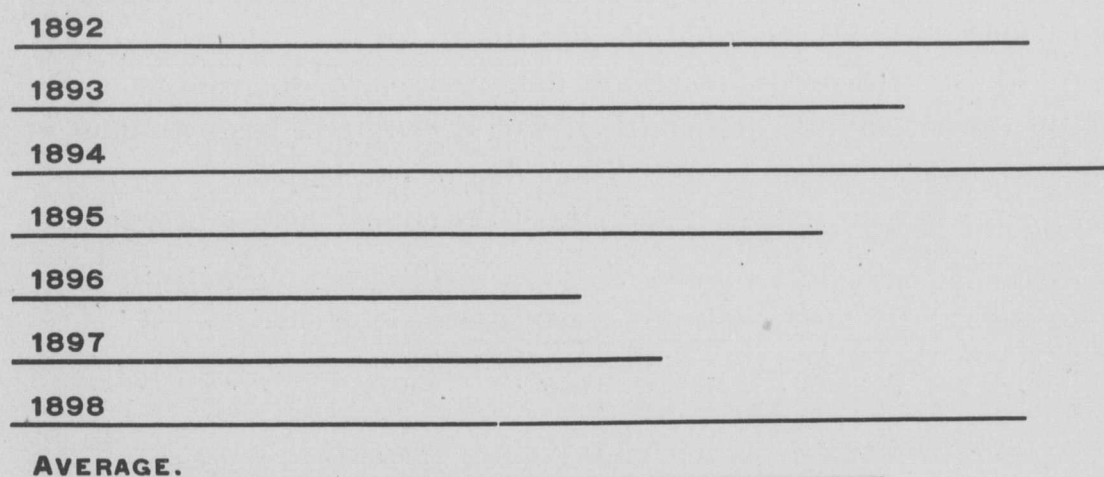
This table, made from the totals of No. 1, shows that a sale was involved in the release of 18%. Remortgaging occurred in 43%, foreclosure in 4%, and straight payment in 35% of the cases.

| TABLE NUMBER THREE—MORTGAGES FILED. | | | |
|-------------------------------------|---------|----------------|---------------|
| YEAR. | Number. | Average amount | Total amount. |
| 1892 | 359 | \$791 99 | \$284,324 65 |
| 1893 | 310 | 787 31 | 244,065 13 |
| 1894 | 380 | 803 47 | 305,320 39 |
| 1895 | 329 | 664 08 | 218,482 24 |
| 1896 | 235 | 651 47 | 153,095 64 |
| 1897 | 214 | 818 90 | 175,244 75 |
| 1898 | 298 | 919 85 | 274,115 88 |
| Total..... | 2125 | 5437 07 | 1,654,648 68 |
| Average..... | 303.57 | 778 66 | 236,378 38 |

Table No. 3 shows the total amount of mortgages filed for the past seven years. It includes everything on the books, subsidiary as well as principal. Only one exception was made; a mortgage for \$17,320, filed in 1898, on property nearly all in other counties, was properly omitted.

During the years 1892 to '98, inclusive, 2125 mortgages amounting to \$1,654,648.68 have been recorded, giving 303.57 mortgages a year of \$778.66 each, or a yearly total of \$236,378.38.

Shown graphically on a scale of \$67,500 per inch, the amount for each year is represented as follows:



The rate of interest was not determined because its frequent omission in the record made such an attempt unsatisfactory. It apparently runs from 6% to 10%—the legal rates. A few comparisons may be interesting.

The total of \$1,654,648.68 for the last seven years is equivalent to \$4.19 per acre for the entire county. The yearly average of \$236,378.38 amounts to about 60 cents per acre for the county, or \$1.38 per acre for the 171,867 acres under cultivation. The interest charge on this sum at 7%—a safe estimate—is \$16,546.49 yearly. The total of \$274,115.88 for 1898 is 16% of the value of the farm products and 13% of the assessed value of the real estate exclusive of railroads for the same year.

Table No. 4 shows the total amount of mortgages recorded as released during the year 1898. It includes releases by foreclosure.

This table shows that the releases for 1898 amounted to \$176,676.61. The amount of new mortgages filed during the same year—\$274,115.88—exceeds the releases by \$97,439.27, or 55%. This sum is the net increase of indebtedness for the year.

| TABLE NUMBER FOUR—MORTGAGES RELEASED. | | | |
|---------------------------------------|-----|----------|--------------|
| Year. | No. | Average. | Amount. |
| 1898 | 268 | \$659.24 | \$176,676.61 |

In table No. 5, the foreclosures are given separately.

The percentage of foreclosures, 4, is seen to be the same as shown by the other cases in table No. 2. The actual releases for 1898 may be slightly greater than the recorded amount, but as the figures were taken during February and March, 1899, probably the releases had been nearly all recorded by that time.

As to what the actual mortgage indebtedness of the county is, the writer cannot say; to determine it would require a large amount of work in examining the books. The question can be partly answered, however. March 1, 1899, residents of the county held mortgages to

| TABLE NUMBER FIVE—MORTGAGES FORECLOSED. | | | | |
|---|-----|----------|-----------|-------------|
| Year. | No. | Average. | Amount. | % of total. |
| 1898 | 12 | \$633.37 | \$7600.62 | 4 |

the amount of \$289,285.73 on real property in the county. This determination was made by the register for purposes of assessment. Many mortgages, of course, are held by outside individuals and loan companies.

As to what degree of prosperity or otherwise is indicated by these figures, no definite answer can be given. Any such statement should be based upon much wider investigation, accompanied by a comparison with other counties. The attempt has been made simply to obtain a few facts as accurately as possible, and if it has been successful, the theorizing is willingly left to others. The register believes that the large amount filed during the year 1898 is caused, partially at least, by the increased sales of real estate, the mortgages being given as security for payment.

The statements as to area, population, valuation, and farm products are taken from the excellent reports of the State Board of Agriculture. Many thanks are due to Mr. M. M. Davis, the register of deeds, thru whose courtesy the freest access to the records was obtained.

FARMING AND STOCK RAISING IN AUSTRALIA.

BY E. M. SHELTON.

[Professor Shelton, of the colony of Queensland, in Australia, while visiting America some time since, gave an extemporary lecture to the students in the chapel, the subject as announced being Tropical Agriculture. A summary of the professor's lecture is here given.]

I SHALL speak of a diversity of matters connected indirectly with farming in Australia. My life for the past nine years has been spent in the antipodes, that is away down somewhere below our feet, in that strange continent where things seem to have been piled in topsy-turvy.

Australia is a dependency of the British crown, as it has been from the first settlement. It is in area nearly the size of the United States. If we make no account of small things and if we eliminate the states of Michigan and Wisconsin from the United States, the balance of this great commonwealth would be almost equal to Australia. This would be exclusive of Tasmania and New Zealand. You see from this that our continent is worthy of the name of continent. The country is divided into provinces which we call colonies. We always call ourselves colonists; each subject of Queen Victoria speaks of his colony, not his state. There are five of these colonies or provinces. I will say a word about their political relations, which I find are generally misunderstood. Each of these territories is quite separate and distinct. They have no connection except thru the colonial office in London. Each colony makes its own tariff laws, has its own government, and stands off on its dignity as independent. They even take pains to accentuate this independence not a little, for there is rivalry among these colonies. Each has a different railroad gauge; their laws are not uniform but differ very materially. From the first there has been a very marked emphasis on this distinction of colonies. Queensland has tried to prevent Queenslanders from having connection with others.

There are five colonies on the continent of Australia. Queensland, my home, is in the extreme northeast. Let us lay a map of Australia over that of the United States and compare the position of each colony with that of the corresponding portion of the United States. In doing this, however, we must remember that Australia is in the southern hemisphere; the north is the warmest part; our coldest day is the Fourth of July, and the hottest is Christmas. Queensland would take the place on the map of Australia held by

the northeastern states in America, beginning with Maine and reaching south thru the country to the north line of North Carolina, and extending inland to about the west end of Kentucky. All that great northeastern portion of the United States corresponds to what we call the colony of Queensland. Queensland is about nine times as large as the state of Kansas. It has at the present time a population of a little over 400,000. You see it is not very densely populated. Its chief industries are stock raising and mining. Stock raising, or, as we call it, the pastoral pursuit, is predominant; next to that mining; and after that farming, a very long distance behind.

Next on the map, reaching down to Florida, and over into the Gulf states a little way, you have New South Wales. Its capital is Sydney. New South Wales is the mother colony; that is, it is the first of the Australian colonies that had a government, and it has always taken the first place among the colonies. It has a population of about a million and a half, and has always had a dominant influence upon the other colonies, due to its population, its commercial importance, and its age.

One of the most important colonies, which comes in just west of Florida, upon our scheme, is Victoria, which has for its capital Melbourne, the second largest city in Australia. And then, beyond this, embracing a large part of Texas, comes South Australia, a colony calling for no special mention. It is a somewhat feeble colony, largely desert and sparsely settled. Its principal city is Adelaide. Then over west on the extreme coast comes West Australia, celebrated in recent years for its discovery of gold.

Now in the diagram in which we have marked out Australia upon the map of the United States, suppose we go right south into the Gulf of Mexico and locate an island about the size of one of the western states. There we will have Tasmania. This was formerly called Van Diemen's land, and we call the inhabitants even now Van Diemenians. Out in the Atlantic, on our comparison of maps, we have the lovely group of islands known as New Zealand. These islands extend thru a good many degrees of latitude and have always occupied an important position in Australasia for several reasons. In the first place they are an admirable region climatically as compared with most of the others of the South Sea islands. In New Zealand they grow all of the English crops, having abundant rainfall as a rule; and so a peculiarly English civilization has there taken root, which is sure in the future, as it has done already, to

make New Zealand one of the most important countries in Australasia.

Australia is a country of drouths. It is an arid region for the most part. A large part of the continent lies between 10° and 30° south latitude. Generally, the world over, anywhere between 10° and 30° north or south latitude, (with certain exceptions which are explainable) we find regions of scant rainfall, and consequently little agriculture. Australia is no exception to the general rule. Roughly speaking, we may say that arable land extends in a narrow strip along the coast clear around the continent. In places the interior desert approaches the east coast, but as a rule the union of the sea and land gives a certain downfall of rain which makes it a productive country. The climate has always vastly more to do with the productiveness of a country than has the soil. It is easy to make poor soil good; non-productive soils, productive in a profitable sense; but it is almost impossible to modify the climate so as to affect the productiveness of a country.

In my own colony, Queensland, we have all along the coast an abundant rainfall. In the south the rainfall is about fifty inches, about twice as much as that of Kansas. As we go north into the tropics this amount is greatly increased. In the vicinity of Cairns, ten degrees south latitude, it is two hundred inches. One time I had been out traveling and was returning to the coast; it had rained incessantly the whole day. I came to a government experiment station situated on the side of a mountain overlooking the sea. I went into the house; the manager was a man I knew. I said to him, "You are having a big rain here; how much fell last night?" "Well, I don't know," he replied. Now he kept the government meteorological record, and it was his business to measure the rain that fell. "I emptied the rain gauge last night, and this morning it was running over. Last night it measured 16.7 inches." Now that is a pretty big yarn, but I am not here for the purpose of advertising Queensland, so remembering that, you can take the story on its merits.

I said to an old gentleman, once a sea captain, "What is your rainfall? How many inches?" "I don't know," he answered, "we don't reckon rain by inches here. We reckon it by fathoms." It must have fallen by fathoms at the experiment farm. Now, my next visit to that very experiment station was for the purpose of locating an irrigation plant. At that season it was found absolutely necessary, before we could prosecute agriculture successfully in that locality, to have an artificial water supply, altho the rainfall of the year was

two hundred inches. There is quite a falling off as we proceed inland. One hundred miles inland there is only thirty inches in a year; inland two hundred miles it is twenty-six inches a year; and four hundred miles inland only fifteen inches. I met a friend from northern Queensland who said that at the time of speaking the last rain they had had was three years before; then they had had three inches on a Christmas day.

Out of these peculiar facts have grown the political and social condition of things which we find there in the colonies. Our social and political fabric, as might be expected by the philosopher, is founded on this peculiarity of rainfall. As we go inland we find the country cannot be used for farming. What is the result? What can it be used for? It can be pastured, tho it cannot be turned by the plow. All over Australia the country is divided into two great classes. There is one class of people who depend wholly on their flocks and herds, who lease land from the government. Occasionally they own it in fee, but as a rule they lease from the government great tracts of land known as runs or squattages, and the owner of these runs is known as the squatter. "Squatter's Rights" is a familiar term in America. The American squatter is generally a man who takes a little land belonging to the government and uses it without paying for it. The Australian squatter is a rich man who owns large tracts of land which he has obtained from the government on a thirty-years lease at the rate of from one farthing (equal to half a cent) to three farthings per acre per annum. Whatever he spends in the way of improvement during his tenancy must be recouped when he gives up the tenancy.

In every Australian colony there is in politics a "squatting party" devoted to the landed interests; it is analagous to the Tory party in England. Then there is the liberal party, made up of merchants, laborers and others who are not squatters. There is a sharp distinction in politics between these two. These squatters often possess great estates, the like of which we do not have here to my knowledge. I know of one station which has on it two or three thousand head of sheep alone, and another which follows the sea coast for forty miles. These men are literally the lords of creation. You can see from this that their opportunities, at least, for usefulness are very great.

In Queensland we have to-day about twenty million sheep; in all America there are only thirty-eight millions. We have also about

seven million cattle and a corresponding number of horses and other live stock. Queensland is first of all a pastoral country, devoted to its flocks and herds. You must understand that this is not idle talk; it is a sober statement of facts. I am not a real estate agent.

Traveling thru the interior of Queensland, you may see a succession of high plains, generally rich land, with scattered trees, such as the gidiya, eucalyptus, mimosa, and a great variety of strange forms of vegetation almost unknown in this country. Groups here and there of trees are in sight, and then come miles of country with no trees at all. The ground beneath these trees is not shady. The leaves are lanceolate like the willow, and they hang almost edgewise on the trees, so that they make very little shade indeed. The evergreen trees in Australia shed their leaves without ceasing to be evergreen; all the year round they keep dropping, but the trees are never bare. The eucalyptus trees shed their bark once a year; one can see it splitting off in long strips. These habits are quite different from those of American trees, but that is our way of doing things. I was talking one time to Mr. Bailey, the colonial botanist. He said: "Our trees have no time of flowering, no spring nor autumn, but whenever it rains they grow and bloom. I have seen whole woods in bloom in midwinter; and another time, in the spring. It depends on the rainfall and season. Trees may go for years in dry times and never show a flower at all."

If you talk to a farmer, he will tell you about scrub and forest country. All Australia is divided into these two kinds. The forest is this upper country with trees growing scatteringly, whether singly or in groups, often as few as one on an acre. These trees are almost entirely of the eucalyptus family. Near the coast you will find fairly thick woods alternating with the open plains. On coming to the coast the dimensions of the vegetable growth are enough to startle you. The trees grow to tremendous heights; they seem bent on pushing up into the sky. The growth underneath is a mass of palms and vines and low growing stuff. These twist about so that it is absolutely impossible to penetrate a rod inside of this scrub. That is the name given to the dense timber.

They have there a very singular vine which sends out runners with branches which have recurved claws. These claws dig into the arms and clothing and defy you to make further advance. The colonist call it the "lawyer vine." They make from this vine, however, some of the finest walking sticks in the world. I will tell you

another feature of this scrub which is most interesting to me. You may see sometimes a tremendous tree growing to far heights; look up into the top and you may discover another tree growing in the forks of the big one. The big tree may be a eucalyptus—but the trees generally have no names. The leaves of the one growing in the crotch are coarse and glossy and often two feet in height. Watch attentively this little sprout, the size of a piece of chalk. You will see it has thrown down two little rootlets with white tips. In a radius of a half a mile you may see twenty such examples. The rootlet is not larger than a knitting needle, while its length may be seventy-five feet. One fastens in the ground on one side of the tree and another on the other side.

There is significance in that. As soon as the rootlet has struck its tip into the ground it takes root, and the part above ground grows to be like the stem of a tree. These rootlets come down from the branches of the big tree on all sides, take root and grow until the tree is enveloped by them. Wherever two of them rub against one another they become welded together, and two or three of them may form a slab of timber, perhaps two feet across, with holes in it. In time the whole big tree is enclosed in this case of roots. They grow against the tree and crush it. They draw the nutriment out of the ground beneath it. Growth goes on. As the bark and decayed portions of the old tree fall down they are converted into food for the greedy parasite. The parasite is a ficus, a member of the india rubber family. I have seen a clump of the roots of one of these trees as large as the chapel rostrum; away in the center is the trunk of the old tree.

While you have been standing and watching the tree and not moving your feet about, presently you feel a sting on your ankles. You pull up the edge of your pants and find the land leeches have fastened upon you. The best thing to do is to return to camp and pour kerosene on them, and thus get rid of the incumbrance.

Another fact about Australia is associated with the practise of squatting, one which no student of Australasian history should forget. Grass is everywhere, even in the forest. Grass grows right up to the feet of the trees, and in the vast majority of cases it is an exceedingly sweet and nutritious food for all classes of herbivorous animals. We do not have there, as here, to cut down the trees and clear the land in order to get supplies of food for the cattle, because the grass is everywhere. Ride out west into the "never never"

country and see there these everlasting growths of grass; sometimes not very high, sometimes up to one's waist; but always nutritious. That is why Australia can compete with any other country on the globe in the production of wool and meat. Valuable as artificial fodders are, and necessary, there is no agricultural community on the globe which can hope to compete in the matter of cheap production with the growers of stock who have access to these abundant grass lands. Grass is everything, and grass we have on the Australian continent in the greatest profusion.

How about the other Australian colonies? The country is underlaid with artesian water. We have only to go into the ground one or two thousand feet to get abundant supplies of the best water. It is hot, too hot to hold your hand in; but there is no trouble in cooling the water. Accordingly, our stockmen are reaching down extensively to this natural supply of stock water. Once when I happened to be in the western country I visited a squatter who a few months before had opened an artesian well. Water was flowing in a stream three inches in diameter, with such force that it rose to a great height. Sixty feet away from this well it flowed in a swift stream four feet in width and nine inches in depth. I asked him what he was doing with that water. He told me that the stream of water was flowing for fourteen miles across his run. It requires no effort of imagination to see that this discovery of artesian water means a complete changing of conditions in the interior of Australia. Sheep and cattle will stand almost any amount of drouth if water is there for them to drink.

In the whole interior of Australia rains are tolerably certain in January and February. No sooner do the rains come than the aspect of the entire country changes. The empty watercourses which you have been crossing in the coach become full. They gradually swell until frequently little creeks become thirty or even forty rods in width. It is extraordinary to see the wonderful change that comes over that country in the rainy season. As this flood of water subsides after the rain ceases in February, and as the summer heats come on, another wonderful transformation takes place. First of all there springs to the surface a great mass of annual plants; the natives call them carrots, and they are a sort of carrots; they are a peculiar species. They grow to the height of six inches or a foot; but they are ephemeral, existing no longer than a few weeks at most. All these annual plants are greedily consumed by every class of

stock. Never in my life have I seen cattle and sheep feed as they do on this carrot growth. After this the native grasses come. Blue grass, kangaroo grass, and other grasses not known to you, start up in extraordinarily rich number in the sun.

This will serve briefly to introduce to you the squatter area of Queensland.

Our farming is done almost entirely on the coast. In the south, corn and potatoes are grown. The farmers begin to plant these in August, and keep on until the following February. There is plenty of chance for the late farmer. The crops of corn are nearly or quite equal to those produced in this state. Of potatoes two crops are raised, a summer and a winter crop. In the north the great crop is sugar cane. Some of you may have no idea what a crop of sugar cane means. I have seen crops of sugar cane myself which come to fully seven or eight tons per acre—not seven or eight tons of cane, but seven or eight tons of sugar to the acre. With the extraordinary productiveness of the tropical sugar cane, it is a crop that involves much labor. Moreover, it has two or three years of life; the first year is the planting; then in the next two years are the first ratoon and second ratoon respectively. There may be four or five crops from the first planting, but the best is the second.

I want to say in conclusion that while we have many good and wonderful things in Australia and in Queensland, yet you have a lot of good things right here in America. While I do not wish to dispraise Australia, nor be over-modest, I want to say that we have no country in that continent which can compare agriculturally with what you can see in the United States. I remember seeing a statement by Caird, the eminent statistician and agriculturist, that in a radius of 500 miles west of Chicago there is the best bit of agricultural land in the world. We might take much more land into the radius and still the statement would hold good. No land in the world can match eastern Kansas, Missouri, and Iowa. Therefore do not go to the Philippines, to Australia, or to any other country, with the expectation that you will ever see such good country as that between where we are now meeting and Chicago. There is no other such tract of agricultural land on earth. However, there is ample room in Australia for thousands of Americans if they will take up with the conditions that exist. And we will give a cordial welcome to the enterprising man of business. Come as graduates of an agricultural college, and you will certainly be greeted with a hearty welcome, and

given every chance for work and ultimate success that a people can give to well-meaning, earnest immigrants. Yet after all, it may well be questioned whether you can do as well there as you can at home.



A NEW CROP FOR KANSAS FARMERS.

(Press Bulletin No. 24, Kansas Experiment Station, Manhattan, Kansas.)

THE KANSAS EXPERIMENT STATION has been growing the soy bean for the past ten years, starting with a small patch, and increasing the area until last year 35 acres were grown. It is a good drought resister, is not touched by chinch bugs, and the beans are richer in protein than linseed meal. With sufficient moisture to germinate them, a crop can be grown after wheat and oats are harvested. In 1896 the yield on ground after wheat was 8 bushels per acre; in 1898, 6½ bushels.

With linseed meal at \$25 per ton, these crops after wheat would be worth \$6 and \$4.68 per acre. When planted earlier in the season, the yield of soy beans is from 10 to 20 bushels per acre. The soy bean not only furnishes a crop rich in protein, but at the same time enriches the soil. Henry Rogler, one of our graduates, reports an increase in large fields of 5 bushels of wheat per acre on land where soy beans had previously been grown, over land that had not been in soy beans.

With dairy cows, soy bean meal takes the place of linseed meal, being somewhat richer in protein, a laxative feed, and softening the butter fat. Not over 3 pounds per day should be fed to a cow, and the softening effect on the butter may be overcome by giving feeds having the opposite tendency, such as corn, Kafir corn, and cottonseed meal.

In the winter of 1898, in fattening 7½-months-old pigs, the gains per bushel of feed were:

| | |
|---|--------------|
| Kafir corn meal..... | 11.7 pounds. |
| Shelled corn..... | 12.3 " |
| Kafir corn meal four-fifths, soy bean meal one-fifth... | 13.9 " |

With pigs 6 months old the gains per bushel of feed were:

| | |
|---|-------------|
| Kafir corn meal..... | 9.4 pounds. |
| Shelled corn..... | 11.2 " |
| Kafir corn meal four-fifths, soy bean meal one-fifth... | 13.2 " |

With both lots the pigs having soy bean meal made the most rapid growth and were ready for market much earlier.

With weaning pigs the gains per bushel of feed were:

| | |
|--|--------------|
| Kafir corn meal..... | 10.4 pounds. |
| Corn meal..... | 11.5 " |
| Kafir corn meal two-thirds, soy bean meal one-third. | 15.4 " |
| Corn meal two-thirds, soy bean meal one-third..... | 15.6 " |

In the fall of 1898 this station bought of farmers 60 ordinary stock hogs of mixed breeding. The gains per bushel of feed in fattening these hogs were:

| | |
|---|-------------|
| Kafir corn meal..... | 7.5 pounds. |
| Kafir corn meal four-fifths, soy bean meal, one-fifth.. | 12.0 " |

The hogs fattened with soy bean meal have just been marketed, while those not having it will not be ready for four or five weeks.

The soy bean is an erect-growing plant, $1\frac{1}{2}$ to $3\frac{1}{2}$ feet in height, with stiff stem, having branches thickly covered with pods. Cold weather hinders its growth, and for this reason it is not best to plant until the middle of May; and, if the rainfall is sufficient, a planting may be made as late as July 1. The ground should be in good tilth, and the weeds thoroly killed just before planting. Plant in drills, the rows 32 to 42 inches apart, dropping seeds 2 inches apart in the row. One-half bushel of seed per acre is required. Cultivate as for corn, using small shovels on the cultivator, and being careful not to ridge the ground. When the pods turn brown, cut either with a self-rake reaper or with a common cultivator rigged up with two horizontal knives bolted to the inner shanks. Put the stalks in cocks, where they should be kept until cured. Thresh with a common threshing machine. Run slowly and use all blank concaves. The beans may be fed whole or ground.

We believe the soy bean is worthy of a trial in all parts of this state, and that the trial should not be made on less than an acre; five acres would be better. Hundreds of people have tried planting a quart of seed, with the result that grasshoppers and rabbits harvested these small patches.

TENDENCIES OF THE KANSAS STATE AGRICULTURAL COLLEGE.

BY THOMAS ELMER WILL.

THE question has been raised as to the present tendencies of the Kansas State Agricultural College. The Kansas State Agricultural College is a public institution maintained by the people, primarily of the nation, secondarily of the state of Kansas. The inquiry is therefore entirely proper, and a courteous and candid reply is due.

It is also proper to inquire first what the tendencies of such an institution ought to be. For reply we turn to the law to which the College owes its existence. In section four of the act of July 2, 1862, we find that the interest upon moneys derived from the sale of lands granted by congress to states and territories is to be inviolably appropriated "to the endowment, support, and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the *liberal* and *practical* education of the industrial classes in the several pursuits and professions in life."

□ The paragraph will bear re-reading and reading again and memorizing in substance if not in words. Military tactics are included, and rightly if defensive war only is contemplated. Care is taken not to exclude scientific and even classical studies, but special emphasis is laid on two subjects, namely, agriculture and the mechanic arts. And the avowed object of such instruction, whether in any or all of the preceding, is "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." A more catholic provision it would be difficult to conceive. Those who toil in the world of matter not less than those who labor in the realm of mind, those who perform the nation's work in overalls and roundabouts, who callous their hands and begrime their faces, as well as those who dress in doeskins and corkscrew diagonals, silk hats and patent leathers, and plead law, preach sermons, administer drugs, or shuffle bank notes and commercial paper, are to be fitted for their work; and the nation is to furnish the means.

The supplementary act of August 30, 1890, appropriating the "Morrill Fund," contains in section one the following language as to the uses to which the funds appropriated may be put: "To be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural, and economic science, with special reference to their applications in the industries of life and to the facilities for such instruction."

This provision is slightly less broad than the foregoing: under it instruction may not be given in either ancient or modern languages save English. The emphasis of position, however, is again laid on agriculture and the mechanic arts; the mathematical, physical, and natural sciences are this time specifically mentioned; and, news tho it may be to those who see in a land-grant institution nothing but an experiment station and a "cow college," the *bete noir* or red dragon, ECONOMIC SCIENCE, is not only permitted by construction but specified by name. The practical bearings of these land-grant colleges are still, after the lapse of twenty-eight years, kept in view; for the instruction authorized in the sciences mentioned is to have "especial reference to their applications in the industries of life;" in a word, not only pure but applied science is to be taught—even applied economics!

Obviously, then, neither the law of 1862 nor that of 1890 contemplates a purely agricultural college, if by this is meant an institution in which agriculture and agriculture only is taught. Such an institution would be not only preposterous but scientifically impossible. The students in land-grant colleges come quite commonly directly from the farms, bringing with them little or no scholastic preparation save that furnished by the common district school. While a short course of three months in agriculture only might be possible, even the celebrated short courses given by the agricultural departments in Wisconsin and Minnesota include several other lines of study in addition to agriculture pure and simple. A four-years' agricultural course, such as is now given by the Kansas State Agricultural College, must include, as an agricultural specialist himself must recognize and concede, numerous other studies than those purely agricultural. What, for example, were agriculture without chemistry and physics of the soil? Who, again, would regard a strictly agricultural course complete that omitted instruction in veterinary science, botany, and the elements of geology? Almost equally appropriate in such a course are studies in entomology, horticulture and forestry.

And thus the list of valuable sciences appropriate to a specifically agricultural course grows. But how can the student handle such sciences without some preliminary or accompanying training in certain other subjects not agricultural at all, as, for example, English and mathematics? That a course may be agricultural in any adequate sense, it must be much more than simply agricultural.

What now has the College within the past few years been doing for agriculture? First, as to its course of study. Its position two years ago among the agricultural colleges of the country may be shown by the following table.

Number of class hours in agriculture taught in a four-years' course in various colleges and universities: Wisconsin, 540; Iowa, 529; Illinois, 482; New York, 420; North Dakota, 390; Rhode Island, 382; Texas, 368; Missouri, 342; Georgia, 324; Delaware, 322; Colorado, 300; Arkansas, 296; South Carolina, 270; Mississippi, 240; Louisiana, 232; New Mexico, 220; Kansas, 185; New Hampshire, 160; New Jersey, 158.

Kansas, that is, at the time when its alleged tendency away from agriculture began, stood within two numbers of the foot of the class, as regards agricultural instruction, among the institutions named. Now, with 424 hours, when purely agricultural studies are counted, it stands within three of the head; while if horticulture and veterinary science, two subjects intimately related to agriculture and perhaps equally important, are also taken into account, the Kansas College leaps well to the front, with the splendid showing of 1090 hours. Again, 100 students have taken the 424 hours of agricultural work in this institution, while only 8 have taken the 540 hours in Wisconsin.

To be more specific, June 30, 1897, found the College with a single course of study, highly general in its nature, and containing two terms, or 130 hours, of agriculture and one term, or 50 hours, of agricultural chemistry. The College now maintains, in addition to several other courses, a four-years' course in agriculture, including the following studies: Agriculture, 60; hygiene of farm animals, 42; tillage and fertility, 70; dairying, 60; crop production, 50; agricultural chemistry, 70; agricultural mechanics, 24; stock feeding, 60; breeds and breeding, 50; agricultural bacteriology, 70; agricultural physics, 60; agricultural economics, 50.

The last on the list, like most of the others, is taught by the Agricultural department.

The ratio, then, of opportunity in the College for strictly agricul-

tural work at the date first mentioned to that at the present time is 180 to 666, or 1 to 3.7. In other words, the student now has more than $3\frac{2}{3}$ times as much opportunity to do strictly agricultural work as he had two years ago.

A word next as to the college dairy school. For ten years the College had talked about the need for a dairy school in Kansas. The biennial report of 1896-7 contained a request for a legislative appropriation for this purpose, tho the writer was sent to Topeka in the interest of the College, with private instructions to ignore this request. After July 1, 1897, the College determined to have a dairy school, and to show its determination by making a start without awaiting an appropriation. The barn office and an adjoining room were taken for this purpose, and later supplemented by a grain bin and the young men's dressing room. Three hundred dollars were put into apparatus, and a scrub herd was purchased. The dairy school opened in January, 1898, with 6 special dairy students, while 24 others from the four-years' course received dairy instruction during the year. The second term of the dairy school opened in January, 1899, with 25 special dairy students who were reinforced by 20 more from the other courses. These students fairly trod upon one another in their crowded quarters. Legislative committees came, saw, and were conquered. Thirty-four thousand dollars were voted for a dairy building, equipment, herd and shelter.

To provide milk for the use of the dairy school, and to ascertain what proper feeding and care would do for grade animals, a scrub herd of 30 cows, much inferior to average Kansas cows, was purchased. The average receipts from these cows were more than double those from average Kansas cows. The worst cow in this herd produced butter fat at a cost to the College of 15 cents per pound; the best cows produced butter fat at an average cost of 7 cents. Were the lesson taught by this experiment utilized by Kansas farmers and dairymen, and the grade of the average milch cow in the state raised by the difference between the worst and the best cows in the college herd, the gain to the state would be \$3,000,000 per annum. Conservative dairymen have declared the value of this experiment to be greater to the state than that of any other work ever done by the College. One editor says:

When Professor Cottrell went out and bought a number of cows of the kind the average farmer keeps, and put up a cheap milk shed of the "every-farmer-can-afford-it" sort, he did so because he knew that the farmers of Kansas are

not farming for fun merely, and that they want some common-sense experiments up at Manhattan, and that they want some experiments that will do some good as well as read well.

Seed, like cattle and horses, can be improved by breeding. The Gartons of Lancashire, England, by crossings and selections for seventeen years increased the oat yield on experimental fields 60 per cent, and the wheat yield 100 per cent. Were similar work to be done for Kansas, the increased yield in oats would amount annually to 50,000,000 bushels, and in wheat to 120,000,000 bushels.

Experiments indicate that the protein or muscle-producing content of corn may be increased by selection and breeding two to three per cent. An increase of but one per cent would be worth to Kansas corn raisers \$380,000 per annum.

The work of seed breeding has recently been taken up by the Kansas Experiment Station. A member of the force is now at Cornell University, at his own expense, devoting his entire time to the study of this subject under the direction of experts. The three departments of Agriculture, Chemistry and Botany at this College are coöperating in seed-breeding experiments. They have already found that surprising variations exist in the nitrogen content of corn as respects varieties, individual ears of the same variety, and individual kernels of equal weight on the same ear; and are practically convinced that the per cent of nitrogen in corn may be materially increased and its feeding value thereby correspondingly enhanced by the improvement in varieties thru intelligent selection and breeding.

The results of the experiment-station work are distributed thru bulletins. Of the pamphlet bulletins such statements as the following have been made:

"Bulletin No. 77 is the grandest that has been issued from your college." A Rochester, New York, firm of seedmen asked permission to reprint five thousand copies of this bulletin. Of Bulletin No. 81 a dairy paper said, "This bulletin for practical information is worth its weight in gold ten times over." A Minnesota farm paper says of this bulletin: "If the farmers will read this bulletin and follow its teaching their success in dairying will be assured, and in the near future the state will be found well to the front in this industry. This bulletin alone is worth more than all the station has cost for the period of five years, and should be read and its teachings followed by every dairyman in the state."

The School of Agriculture at Gizeh, Egypt, wrote for the publications of the Kansas station, saying, "These valuable productions are most useful in such an institution as this."

A letter has just been received from the Junta de Agricultura, Industria y Comercio, at Havana, Cuba, asking for reports of the College and station, as they desire to become acquainted with it.

A Kansas farmer writes in contrasting our bulletins with those from Cornell and the United States Department of Agriculture, "I am so favorably impressed by the excellence of your station that I am proud to say that we farmers of Kansas need hardly go outside of our state for information on matters concerning the agriculturist." These quotations might be multiplied at will.

Brief press bulletins are issued weekly or oftener, and published in the papers of almost every county in Kansas, in agricultural papers in almost every state in the Union, and in many of the papers of Europe. Thru these press bulletins, thus widely scattered, information is conveyed in popular form to multitudes who are not reached by the more expensive pamphlet bulletins or have not time to read them. To these publications such references as the following have been made:

We publish everything that comes from you with great pleasure, and consider the matter furnished by you to be of great value to our readers.

We cannot refrain from complimenting the Kansas Experiment Station upon the admirable series of press bulletins which it is issuing. . . . The Kansas press bulletins enjoy and deserve a wide circulation thru the press of the country.

As I write, the *Chicago Dairy and Creamery* for April 1 is handed me, on page 2 of which I find a two-column article entitled, "A Valuable Common-Sense Experiment," and beginning thus:

The Kansas Experiment Station has issued a press bulletin in which it has given the results of an experiment which should commend the work of the station to every farmer and business man in that state.

It then gives in substance our Press Bulletin No. 29, "Milking Scrub Cows." On page 13 of the same paper appears a one-column article entitled, "A State Experimental Dairy," opening as follows:

It must inspire a feeling of pride in the old timers in the Kansas legislature, and in the Kansas farmers who have for 25 years permitted the interests of the dairy industry in that great state to suffer, to read "Condensed Notes from a Crowded Dairy"—

by Assistant Otis, of the Agricultural department of this College.

A powerful agency for the development of agriculture is the farmers' institute. Kansas for years lagged in prosecuting this

work. The state has appropriated nothing, and the College has asked for nothing, to assist farmers' institutes. During the same time Wisconsin has been appropriating annually \$12,000, Minnesota \$13,500, and New York and Pennsylvania \$15,000 each. Kansas farmers are in competition with these better-instructed farmers, as well as with those of the whole world. It is noteworthy and suggestive that the states in which the farmers' interests have been cared for are those in which heavy conservative majorities are polled; while Kansas, the state in which the farmers' interests have been less considered, is the state in which tremendous conservative majorities have been turned into majorities favoring a change in policy.

Between July 1, 1890, and July 1, 1899, the Agricultural College assisted at 209 farmers' institutes. Indiana held 185 in the single year 1897; Ohio held 284; and New York, 300. Of the 209 named, 91, or more than 43%, have been held since July 1, 1897. During the present winter the three men on the Farm department staff have attended 35 farmers' institutes, and have declined invitations to 133 others on account of lack of time. The need for farmers' institutes was strongly stated in our last biennial report, page 44-6, and an earnest effort was made to secure state aid for this enterprise, with the result that \$2000 per year for the biennium was granted. With this appropriation, and the plan last year devised for economizing institute funds, from two to three institutes can be held in each of the 105 counties in the state, during the next year and the year following.

As to the cost of institutes: The average cost of the 118 institutes held previous to July, 1897, was \$18.93; the average cost of the 91 held since that date was \$10.59; while in 1898-9 it was found that by grouping the institutes the average cost could be reduced to \$7.77. The following table gives the figures:

FARMERS' INSTITUTES.

| YEAR. | Number. | Total cost. | Average cost. |
|--------------|---------|-------------|---------------|
| 1890-1 | 27 | \$254 33 | \$18 74 |
| 1891-2 | | 251 79 | |
| 1892-3 | 11 | 264 01 | 24 00 |
| 1893-4 | 17 | 342 12 | 20 12 |
| 1894-5 | 22 | 398 10 | 18 10 |
| 1895-6 | 22 | 336 81 | 15 31 |
| 1896-7 | 19 | 386 56 | 20 34 |
| 1897-8 | 30 | 489 94 | 16 33 |
| 1898-9 | 61 | 473 97 | 7 77 |

A sure index to the success or failure of a department or institution is the degree of student interest aroused. Students, faculty and all other informed persons can bear witness that for several years prior to July 1, 1897, the Agricultural department of this College was weak and unpopular. They can also testify that since that date this department has enjoyed a genuine boom. Students now believe in agricultural study, and are proud of their prospective calling. Not satisfied with the greatly enlarged opportunities for agricultural study in the special four-years' agricultural course, they organized early in the fall of 1897 a Students' Farmers' Club, that they might carry still farther their agricultural investigations. This club has been a success from the start, and has recently been obliged to change its quarters to accommodate its increased numbers. Full reports of the meetings are given regularly in the *Students' Herald*. Under the head, "Proud of Their Vocation," the *Farmers' Voice*, of Chicago, Feb. 4, 1899, says:

Whatever of justice there may have been in the past in statements made to the effect that agricultural college students deserted the farms when their college course was ended, it must be manifest to all who keep in touch with the movements of college students and of graduates that such a statement can no longer be made in truth.

It quotes an 18-line account of the Farmers' Club from the *Students' Herald*, and adds:

Young men do not form clubs to discuss the details of a profession in which they are not interested, or one which they intend to desert.

The hold of the Agricultural department upon the people of the state is in a measure reflected by the legislative appropriations for that department. Between July 1, 1890, and June 30, 1897, the total amount appropriated was \$700, averaging \$100 per year. In 1897 the legislature appropriated \$1500 for the Farm department for the biennium ending June 30, 1899. At the session recently ended they appropriated to that department, as stated above, \$34,000. Following is the table of legislative appropriations for the Farm department:

| | |
|---------------------------|-----------|
| 1890-1..... | \$200 00 |
| 1891-2..... | 000 00 |
| 1892-3..... | 000 00 |
| 1893-4..... | 000 00 |
| 1894-5..... | 000 00 |
| 1895-6..... | 250 00 |
| 1896-7..... | 250 00 |
| 1897-8..... | 1050 00 |
| 1898-9..... | 450 00 |
| Total for nine years..... | \$2200 00 |
| Average per year..... | 224 44 |
| 1899-1901..... | 34,000 00 |

For many students who ought to get the benefit of such an institution as this a four-years' course is too long. For the benefit of such, short, twelve-weeks' courses have been arranged, to occur on two consecutive years in midwinter, with the object of drilling young men directly from the farms in methods and principles which may be applied immediately on their return to the farm and which will enable the student to coin his labor directly into cash. With the agricultural work it is planned to give such instruction in blacksmithing and the use of carpenter's tools as shall enable the student to do all ordinary repairing on the farm.

With the legislative appropriation of \$34,000 it is planned immediately to erect an agricultural building, including a dairy, in which high-grade instruction will be given in creamery butter-making, cheese-making, and milk production. From this date Kansas should stand in the front rank of states giving instruction in dairying.

Following agriculture, a word may be said as to horticulture. The curriculum of June 30, 1897, provided one term of horticulture (70 hours) for both sexes, and one term of floriculture (60 hours) for young women. It also provided one term (50 hours) of instruction in entomology. The Agricultural course now gives: Horticulture, 96 hours; entomology, 50; vegetable gardening and small fruit culture, 70; pomology, 42; forestry, 30—the ratio being 120 to 288, or 1 to 2.4, for young men, while the young women, in their special Domestic Science course, are far better provided with work adapted to their special needs than ever before.

The Horticultural department furnishes the following statement:

HORTICULTURAL DEPARTMENT, EXPERIMENT STATION.

This department has in operation the following lines of experimental work:

I. *Fruit Improvement.* 1. An attempt to improve domestic varieties of orchard fruits by attention to the principles of breeding. 2. A test of promising new varieties of fruit, especially those originating within the state. 3. An attempt to develop the hardy native fruits of western Kansas, such as plums, cherries, and currants, and introduce varieties that will be profitable under cultivation.

II. *Methods of Orchard Treatment.* A trial of various methods of cultivation and kinds of soiling crops adapted to orchards in this state.

III. *Races of Peach.* A coöperative test carried on in connection with other experiment stations to test the adaptability of the various races of the peach.

IV. *Methods of Grape Pruning and Training.*

V. *Variety Tests.* Tests of the productiveness and value of varieties of fruit and vegetables for Kansas conditions.

VI. *Storing and Marketing of Fruits.* A series of investigations covering the

points of thinning; picking, packing, shipping, storing and marketing. The department has had the coöperation of cold storage houses of Kansas City and Topeka, and has carried on experiments with both fruits and vegetables. A bulletin on Cold Storage for Fruit is now in press.

Several press bulletins on practical subjects have recently been issued and have been widely published by the press.

COLLEGE.

The department has advanced the agricultural educational work in the following ways:

I. By courses of instruction, industrial practise, etc., in classes at the College, over 100 students being enrolled in such classes. Short courses in horticulture are, if approved, to be instituted next year as divisions of the Farmers' Short Course.

II. By addresses and lectures at farmers' institutes and horticultural societies, and committee work in connection with the State Horticultural Society. A large extension of the farmers' institute work is being planned for the coming year.

III. By writings and publications other than bulletins of the Experiment Station. The work includes personal correspondence, weekly newspaper articles and papers written for horticultural meetings.

The influence of the department among the people of the state is indicated by their general knowledge of what the department is doing, their eagerness for department publications, general acceptance of results obtained and readiness to coöperate in investigations proposed by the department.

The operations of the department are constantly broadening and are being prosecuted with one end in view, viz: To educate the people of the state and help them discover and put into practise the best horticultural methods.

The practical value of the work of this department may be indicated by such facts as the following: Kansas grows seven and a half million apple trees; the annual value of her apple crop is \$1,000,000; under proper treatment and culture, such as the Agricultural College teaches, these should produce on an average \$1.00 each per annum or \$7,500,000. If Kansas apple growers knew how to pack properly their apples placed in cold storage the annual saving might easily be \$50,000.

The possibilities of cold storage are great. Had Kansas raisers of Jonathan apples last September placed their crops in cold storage in Kansas and adjoining states when these apples were worth \$4 per barrel, they might later have sold them for \$7 per barrel, which, after paying cold-storage charges of 50 cents per barrel, would have left the producers a profit of \$700,000.

Scarcely second to the Agricultural department in importance to Kansas farmers, is the department of Veterinary Science. The old curriculum provided 50 hours of anatomy and physiology, 60 hours of zoölogy and 60 hours of veterinary science. The new Agricultural course contains: Hygiene of farm animals (already mentioned), 42

hours; physiology, 50; biology, 60; agricultural bacteriology, 70; comparative anatomy, 52; veterinary science, 50. Not counting, then, the now enlarged opportunity for advanced and postgraduate study furnished by this department, the ratio of opportunity in the lines in question under the old course to that now afforded is 170 to 324, or 1 to 1.9.

It should also be added that the student demand for advanced work in bacteriology and histology is so great that at the beginning of every term in the year students are turned away from the Veterinary department.

Two years ago found the Veterinary department with no laboratory worthy the name, tho laboratory work is the foundation for advances in this science. For the work of the Experiment Station, a laboratory has since been equipped and experiments have been made along the following lines:

(1) Four extensive tuberculin tests and resulting post-mortem examinations. (2) Mastitis in cows. (3) Infectious scours in calves. (4) Sniffing disease in pigs. (5) Swine plague protective inoculation (an experiment in which positive results have been secured). (6) Blackleg protective inoculation. (7) Vaccine to inoculate and protect against blackleg. (8) Rabies in horses. (9) Roup in poultry. (10) Lice on cattle (good results have been secured). (11) An infectious disease of the genital organs of heifers. (12) Bacteriological examinations of milk on an extensive scale. (13) Treating outbreak of panaritium in college herd. Every experiment has resulted in practical benefit to some person or community.

The present veterinary laboratory facilities, tho far superior to those found here two years ago, are still entirely inadequate for the needs of this department. Room is also badly needed. The recent legislature was asked to enlarge the Library building, in which this department is located, with a view to providing the needed room; this, thru misinformation, they failed to do. Nothing daunted, however, it is proposed to crowd three stories of the museum into two, and give the Veterinary department the splendid ground floor thus gained.

The college veterinarian is, by law, the state veterinarian, and subject to the call of the State Live Stock Sanitary Commission. That these calls might not cripple the college and station work, the legislature was asked to appropriate \$1800 per annum for the state veterinarian; this they did, and a new man will be added to the force

of the department next summer. The legislature also voted \$950 for microscopes and other equipment for the Veterinary department. This department acts as a bureau of information to the farmers and stockmen of Kansas. About one hour daily is devoted by the department, aided by a stenographer and typewriter, to answering letters. The department inspected the tuberculous herd and ordered it slaughtered; it has published a thirty-page bulletin on Bovine Tuberculosis, and press bulletins as follows: (a) Blackleg; (b) *Taenia Fimbriata*; (c) Lice on Animals; (d) Blackleg; (e) Blackleg. It has also participated in farmers' institute work, in meetings of the State Board of Agriculture and in the National Association of the Live Stock Sanitary Boards at Omaha. The veterinary professor is also the veterinary editor of the *Kansas Farmer*, veterinarian for the State Board of Agriculture, and bacteriologist for the State Board of Health.

The most fatal cattle disease in Kansas is blackleg. To protect the herds of Kansas farmers and stockmen against its ravages the department produces and distributes free protective vaccine. Within the past six months the department has sent out vaccine sufficient to inoculate thirty thousand calves. The commercial value of this vaccine has far exceeded the cost of running the department for the past two years. The results have been most satisfactory. The value of live stock saved by this vaccine has been conservatively estimated at \$60,000! The following are extracts from the correspondence of the department on this subject:

The day before I received the vaccine four (4) calves died in one day? I never saw any sign of disease since using it.

The calves treated with the vaccine for blackleg did all right and I lost none of them. I think the vaccine is all right if used at the proper time. Before I knew of the vaccine I tried everything to prevent the disease but failed. Would be pleased to have you send me more vaccine.

I hear that you are sending out vaccine for calves. I have 170 head that I would like to vaccinate. What will medicine cost, or do you send it as an experiment?

Another writes for enough to vaccinate 200 calves and then says:

Out of about 300 head treated in part with the vaccine matter sent me, and in part with some sent to another party in this county, there has been no loss whatever and no ill results from the treatment. In one bunch of twenty-four calves one had already died with what was pronounced a case of blackleg the day before the herd was treated; no more died. From what I see it appears to be a sure preventive.

Experiments along the line of protective inoculation against hog cholera are in active progress. Results similar to those already mentioned are hoped for.

As above indicated, the work of the land-grant colleges is expected to bear especially upon agriculture and mechanic arts. The name therefore, "Agricultural College," is misleading; in fact, almost as much so as would be the name "Mechanical College." Some of the institutions are more correctly designated "Agricultural and Mechanical Colleges." The Mechanical department of this College, however, was established under protest and has existed in the past by sufferance rather than by recognized right. But for an aggressive professor at its head, it might still have resembled a potato sprout growing in a cellar. On June 30, 1897, the course of study provided 60 hours of mechanics and 50 hours of engineering. The work with tools was almost purely elementary, rising only to the dignity of manual training. The department now carries a special four-years' course in mechanical engineering, providing, among other things: Mechanics, 52 hours; hydraulics, 20; machine design, 160; principles of mechanism, 50; mechanics of materials, 70; measurement of power, 84; mechanics of engineering, 60; engineering of power plants, 50; original designing, 100—the ratio of old to new being 110 to 646, or 1 to 5.87. Manual training is still provided for the general students, but the Mechanical Engineering course looks toward the preparation of students for the profession of mechanical engineering. The department is now prepared, on receiving the sanction of the Board of Regents, materially to raise its entrance requirements, introduce still more technical work into the four-years' course, and to provide for a year of high-grade postgraduate work, including thermodynamics, power transmission, steam engineering, steam-engine designing, mechanics of machinery, and laboratory work.

The attendance at the Mechanical department has greatly increased, as the following figures will show:

| Year. | Fall Term. | Winter Term. | |
|---|------------|--------------|---|
| 1896-7..... | 257 | 297 | Admittance refused to over 50 students be- cause of lack of room. |
| 1898-9..... | 356 | 385 | |
| Increase | 99 | 88 | |
| Percentage increase..... | 35 | 30 | |
| Average increase in attendance in two years, 32½ percent. | | | |

An innovation introduced January 1, 1898, is the apprentice system. A limited number of students are admitted to the shops for a course of at least forty weeks of exclusive shop work. This course has proved to be extraordinarily popular, and applicants have been turned away from the start. The effects of this system have been—first, by setting an example of unusually high-grade shop work, to

raise the standard of work done by shop students not apprentices, and to increase the respect of such students for mechanical pursuits; second, by having on hand constantly a body of fairly skilled young men concentrating on a single line, to set in operation considerable work in practical machine building, the product to be used in further equipping the shops or exchanged for other needed machinery. At present the shops are making about three-fourths of the machinery needed to equip the new extension. There is already a steady demand for gasoline engines, which can be produced at the shops.

The new spirit in the Mechanical department is already bringing its reward in a pecuniary way. The last legislature appropriated \$9000 for additional buildings, \$7000 for equipment, and \$5000 for additional boilers, boiler house and engines, or a total of \$21,000, against \$200 in 1889-90; \$200 in 1890-91; 000 in 1891-2; 000 in 1892-3; 000 in 1893-4; \$3745 in 1894-5; \$1770 in 1895-6; \$1300 in 1896-7; and \$1099 in 1897-8.

With these appropriations it becomes possible properly to house the foundry and to enlarge and make more practical and helpful the blacksmithing department and shops. The size of the iron-shops will be increased 250 per cent. The pressure for room will be relieved, the number of apprentices that can be accommodated much increased, and the general efficiency of the department materially raised. With these improvements and with the entrance requirements raised, the course of study strengthened, and a postgraduate year added, the state may congratulate itself that henceforth it will be relieved from the necessity of maintaining more than one department of mechanical engineering at public expense.

While not specified in the law, work in domestic science and household economics has by common consent been accepted as appropriate to a land-grant college. The Domestic Science department at this College is among the oldest in the country, and had attained high standing and favor before the college changes. It had for years, however, been seriously hampered from lack of a suitable building. This building was secured from the legislature of 1897 and erected by the college authorities. It is called by competent and impartial judges the best building in the state for the money. In the basement is found the kitchen and students' dining hall, to be mentioned later. On its ground floor is the department of Domestic Science, with office, reception room, study room, class room, laboratory, etc. On its sec-

ond floor is the department of Sewing. The departments centering in this building are among the most successful and popular in the institution. A special four-years' course of study has been provided for them, including, among other things: Hygiene, 94 hours; household economics, 110; home architecture, 35; chemistry of foods, 30; dairying, 70—as against household economics, 60; chemistry of foods 20; and hygiene, 70. The ratio, therefore, of old to new is 150 to 339, or 1 to 2.26. This course has recently undergone revision, whereby, when accepted by the Board of Regents, it will materially increase the opportunity for the distinctive work of the department.

Like the departments of Agriculture and Mechanics and the department of Horticulture, the department of Domestic Science, including sewing, has prepared a short course to be put into operation, if approved by the regents, at the beginning of next fall term. It will include three months of work in each of two consecutive years, and is designed to meet the needs of young women who need practical training but cannot spend four years in college.

Next as to economics, the bone of contention, but a subject for which, as seen, specific provision is made in the act of congress of 1890. The old course provided for studies in sociological lines as follows: General history, 70 hours; civics, 60; economic science, 50; history of industry and science, 30. It also gave 110 hours to psychology and logic. The new courses other than agricultural and mechanical, which omit these subjects, give 50 hours to psychology and logic and provide for sociological studies as follows: Elementary economics, 28 hours; general history, 60; U. S. history, 50; principles of economics, 70; civics, 60; nineteenth century history, 50; industrial history, 70; economic problems, 60; finance, 50. Omitting the psychology and logic, the ratio of old to new is therefore 210 to 498, or 1 to 2.37; while, if the psychology and logic be counted, the ratio is 320 to 548, or 1 to 1.7. The old ratio of sociological studies to agriculture was 210 to 180 (1.16 to 1); or, counting psychology and logic, 320 to 180 (1.8 to 1). The new ratio is 498 to 666 (1 to 1.33); or, counting psychology and logic, 548 to 666 (1 to 1.2): that is, even with the largely increased opportunity for sociological studies in the course, sociological opportunity is now considerably behind agricultural, while in the old course agricultural was still farther behind sociological.

The College, then, within the past two years, has been tending strongly and rapidly toward agriculture and the related lines of horticulture and veterinary science, and toward the mechanic arts

and domestic science. It has also increased the efficiency of the work in economic science; that is, it has been fulfilling in letter and in spirit the laws of 1862 and 1890 to which, as a land-grant college, it primarily owes its life. Another tendency may be noted—one in fullest accord with the theory upon which our public school system is based; that, namely, toward making this great institution accessible to the boys and girls of Kansas. The mass of young people are barred from college by poverty. This evil must be met if free institutions are to survive. This College is seeking to meet it by lowering the students' cost of living at the College. Its dining-hall furnishes meals at cost and its bookstore books and supplies at cost. It desires and expects a dormitory in which rooms may be furnished to students at cost and thru which the growth of the College may no longer be limited by the size of the town. It furnishes much remunerative work to students, thus helping them to earn their way thru College, and it has asked, and not in vain, that the legislature appropriate money toward students' wages. Further, the writer has just received a letter notifying him of a bequest, the first in the history of the college, of an estate valued at several thousand dollars, the proceeds of which are "to go for current expenses of white male students attending the College." May the good work go on! That these inducements and the educational opportunities are appreciated is shown by the unequaled attendance. Strange to say these measures for the relief of worthy students without means have in cases been eyed askance, and even opposed by some. The dining-hall and bookstore conflict with certain local, private interests, and we are boldly told in public prints that these institutions must go, and the interests of the students be sacrificed to the interests of private money-getters. Thru Manhattan opposition the move for a college dormitory was killed at the last legislature. The printing office, in which many of the students earn much of their way, is under the same local ban. Whether the bequest will arouse local opposition remains to be seen. Tho many public-spirited citizens live within the vicinity of the College, not all as yet realize that an institution "endowed by the nation, housed by the state, and maintained by both" is designed for the benefit of a larger area than the village beside which it is established.

What is true locally of measures instituted to relieve the present material needs of students is true both locally and elsewhere, and in a still greater degree, of measures looking toward their permanent

relief from the pressure of poverty. Bitter tho it is, the opposition to the dining-hall, bookstore and dormitory is mild in comparison with the opposition to the economic enlightenment of students. This opposition may take the specious but untenable ground that this College is tending away from agriculture toward economics; but this, even were it true, would not explain the animus of the opponents to economic instruction in this institution. A single term providing genuine enlightenment on sociological lines would be odious to such. They are entirely willing the young people of Kansas should be taught to cook meals, sew on buttons, fatten pigs, curry cows, make butter and cheese, and increase the annual product of grains and meats, provided their instruction goes no farther. Southern planters before the sixties were equally willing that the black toilers who made the desert blossom should be taught to produce more skilfully and abundantly; the trouble came when these toilers were taught anything else. To teach them to read, and to open the eyes of their minds that they might perceive that they were more than beasts of burden born to drudgery that others might loll in luxury and fatten on the fruits of unpaid labor, was seditious and a crime worthy of banishment or death. In less degree the principle still applies. Producers may be developed and trained until they are veritable Samsons, provided only they be blind Samsons, left to grind thru life in the prison house of the modern Philistines of wealth; but open-eyed, enlightened Samsons there is no abiding. Christianity might have been taught in the Roman Empire along with scores of other religions but for the fact that it preached deliverance to the captives and the setting at liberty those that were bound. Exponents of such doctrines might fitly light up Nero's race track. And when has the time been that an exploiting class was willing that its victims should be enlightened as to the processes by which they were despoiled? Are not the silversmiths of Ephesus ever with us; and are we to imagine that modern trusts and monopolies and their advocates, servants, and pensioners will tolerate the enlightenment of American youth as to their methods? Have we forgotten Chicago University and Brown University and the rest of the list; and are not papers even now telling us of Syracuse University, which stipulated in advance that its professor of economics, whatever his qualifications, must not hold certain views however well-grounded, and which has recently discharged him, as is generally believed at the institution, because of

his attitude toward monopolies and trusts? The people of America may as well recognize once for all that the owners of America propose to control college and university teaching, and to strangle and crush every man in the economic field who will not either assist in making of economics an occult science with which to mystify and befog those whom he professes to enlighten, or become an open advocate of policies whereby the utilities of the nation are centered in the hands of a few industrial despots. In this fight for the freedom of science—a bush-whacking fight in which noiseless guns and smokeless powder are the favorite weapons of the representatives of wealth—it is for the American people to say which shall ultimately triumph.



ALFALFA HAY FOR FATTENING HOGS.

(Press Bulletin No. 25, Kansas Experiment Station, Manhattan, Kansas.)

IN the fall of 1898 the Kansas Experiment Station made an experiment to test the value of alfalfa hay when fed daily to fattening hogs that were being given all the grain they would eat. The gain greatly exceeded our expectations, and if further experiments show the same results, alfalfa hay will form a regular part of the rations of every well-fed pig fattened in Kansas in the winter.

The hogs fed in this experiment were bought of farmers, and averaged in weight 125 pounds each. They were placed in lots of 10 each, in large pens, having for shelter some sheds open to the south. The alfalfa hay used was of the best quality, carefully cured. Black-hulled, white Kafir corn was the grain used, the hogs being fed all that they would eat without waste. The hay was fed dry, in fork-fuls, in a large flat trough. The pigs were given more than they would eat, and they picked out the leaves and finer stems, rejecting the coarser stems. One lot of hogs was fed Kafir corn meal dry and alfalfa hay; one lot whole Kafir corn, dry; one lot Kafir corn meal, dry; and one lot Kafir corn meal, wet.

The experiment began on November 24 and lasted 9 weeks. By that time the alfalfa-fed hogs became well fattened, and were marketed. We estimated that it would require 4 to 5 weeks additional feeding, with ordinary winter weather, to get the hogs that were fed

grain alone into good marketable condition. The recent continued extreme cold weather will make the time required considerably longer.

The gains in 9 weeks from the different methods of feeding were as follows:

| | | |
|--|------|-----------------|
| Kafir corn meal, dry, and alfalfa hay..... | 90.9 | pounds per hog. |
| Kafir corn, whole..... | 59.4 | " " " |
| Kafir corn meal, fed dry..... | 52.4 | " " " |
| Kafir corn meal, fed wet..... | 63.3 | " " " |

The gain from feeding alfalfa hay with Kafir corn meal fed dry, over the meal alone fed dry, is more than 73 per cent.

The gains per bushel of feed were as follows:

| | | |
|---|-------|--------|
| Kafir corn meal, dry, and 7.83 pounds alfalfa hay.... | 10.88 | pounds |
| Kafir corn, whole..... | 8.56 | " |
| Kafir corn meal, fed dry..... | 7.48 | " |
| Kafir corn meal, fed wet..... | 8.09 | " |

Ten hogs in 9 weeks were fed 656 pounds of alfalfa hay; and as shown above, for each 7.83 pounds of alfalfa hay fed with the dry Kafir corn meal, the hogs gained 3.4 pounds over those having dry Kafir corn meal alone—a gain of 868 pounds of pork per ton of alfalfa hay. These results are not due to the feeding value of the alfalfa alone, but also to its influence in aiding the hogs to better digest the Kafir corn. The alfalfa hay also gave a variety to the ration, making it more appetizing and inducing the hogs to eat more grain. The 10 hogs having grain alone ate 3,885 pounds of dry Kafir corn meal, while the ten hogs having hay and grain ate 4,679 pounds of the Kafir corn meal and 656 pounds alfalfa hay. The hay-fed hogs ate more grain and gained more for each bushel eaten.

In a former experiment at this College, pigs were pastured thru the summer on alfalfa with a light feeding of corn. After deducting the probable gain from the corn, the gain per acre from the alfalfa pasture was 776 pounds of pork.

These facts indicate that to produce pork most cheaply the Kansas farmer must have alfalfa pasture in summer and alfalfa hay in winter.

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PRES. THOS. E. WILL, Secretary, *ex-officio*.

MILKING SCRUB COWS.

(Press Bulletin No. 29, Kansas Experiment Station, Manhattan, Kansas.)

FROM January 1 to April 15, 1898, the College bought thirty head of common scrub cows, with the object of testing the value for the dairy of this class of cows when properly handled. These cows were purchased in Lincoln county, cost delivered at Manhattan an average of \$34 each, were selected by a farmer who was not a dairyman, and in quality were below the average cows of the state. The cows were shipped from Lincoln county to Manhattan (100 miles) in midwinter, the excitement and weather causing a serious drop in the milk yield of those that had calved. The first week the average daily milk yield per cow was 15½ pounds, the second week 21 pounds.

At the start the cows were fed alfalfa hay and a mixture of two-thirds bran and one-third old process linseed meal, a ration rich in protein, designed to stimulate the milk flow and to partially overcome the effects from shipping. As soon as the cows were brought to a fair milk flow they were put on a ration of alfalfa hay and Kafir corn grain. This ration produced the greatest flow of milk with butter fat at least cost, but had to be dropped at the end of 7 weeks, so that various feed stuffs could be fed in order to show our dairy classes the effect of various feeds on the texture of butter. The daily grain ration averaged about 8 pounds per cow while on dry feed. While on pasture the daily grain ration averaged 3 pounds of a mixture of four parts corn meal and one part of bran. Alfalfa hay was also kept in a rack where the cows could eat it at will when they were brought in at milking time. The yield held up well thru the fall drouth. For a short time green Kafir corn was fed with the pasture, and the cows were pastured on wheat in the fall until the ground became frozen.

Twelve cows were fresh when received, January 5, the rest calving in from one to five months. The records here given are for the twelve, for 1898. The butter fat yielded has been credited at the

prices paid each month by the Manhattan Creamery, which were as follows: January, 17½ cents; February, 17 cents; March, 16½ cents; April, 15 cents; May, 14½ cents; June, 13 cents; July, 13½ cents; August, 15½ cents; September, 16 cents; October, 18 cents; November, 18 cents; December, 17 cents. The feed has been charged at the average retail price in Manhattan for the year: Cost per 100 pounds—corn meal, 55 cents; Kafir corn meal, 55 cents; linseed meal, \$1.25; soy bean meal, \$1; bran, 55 cents; cotton-seed meal, \$1. Cost per ton—alfalfa hay, \$4; corn ensilage, \$1. Pasture, 75 cents per month. It would pay many Kansas farmers who live distant from market to milk cows, if thru the milk they could obtain the above prices, with no additional profits.

RESULTS.—Average yield of milk per cow, 5,707 pounds; best cow, 9,116 pounds; poorest cow, 3,583 pounds. Average yield of butter fat per cow, 238 pounds; best cow, 383.7 pounds; poorest cow, 135.7 pounds. Average cost of feed per cow, \$29.20; best cow, \$32.80; poorest cow, \$26.75. Average value of butter fat per cow, \$37.75; best cow, \$60.88; poorest cow, \$21.39. Average value of skim milk per cow, at 15 cents per 100 pounds, \$7.69; best cow, \$12.29; poorest cow, \$4.83. Average income per cow from butter fat and skim milk, \$45.44; best cow, \$73.17; poorest cow, \$26.22. Average receipts per cow, less cost of feed, \$16.25; best cow, \$40.37; poorest cow, receipts 43 cents less than cost of feed. Average cost of butter fat per pound, 12.2 cents; from best cow, 8.5 cents; from poorest cow, 19.7 cents. The average price received for butter fat for the year was 15.8 cents. To the receipts given above should be added the value of the calf at birth.

This test shows the difference in value between different cows with feed and care alike. The year's record of our best scrub cow (9,116 pounds of milk; 383.7 pounds butter fat, equal to 451 pounds butter; value of products, \$73.17; returns less feed \$40.37) is one of which many a pedigree dairy cow would be proud. This cow is of mongrel breeding but has a pronounced dairy form. The poorest cow's form is a good beef type, and her yield of 3,583 pounds of milk and 135.7 pounds butter fat was worth 43 cents less than the feed she ate. Is stronger argument needed to induce Kansas dairymen to cull their herds and keep only the best?

This test shows that Kansas cows can be made to give greatly increased yields with proper feed and care. We collected the records of 82 herds owned by creamery patrons in one of the leading dairy

sections of the state, finding an average annual yield per cow of milk 3,441 pounds, butter fat 104.5 pounds, value of butter fat \$19.79. Contrast this with the average for the college scrub herd, milk 5,707 pounds, butter fat 238 pounds, value of butter fat \$37.75; and remember that the college herd is much inferior to the average herd of the state.

We attribute the greater yield secured from the college scrub herd to three causes: (1) At all times their rations were either balanced or contained an excess of protein—the material which builds blood and milk—while the Kansas cow usually, when on dry feed, has only half enough protein. (2) Kindness and shelter. Our scrub cows were petted, comfortably sheltered, never driven faster than a slow walk, and never spoken to in an unkind tone. (3) A full milk yield was secured thru the summer drouth by giving extra feed.

Record of Scrub Herd, 1898.

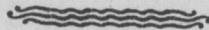
| * Number of cow. | PRODUCTS. | | | Cost of feed. | VALUE. | | | RECEIPTS, LESS COST OF FEED. | | Cost of butter fat, per lb. |
|------------------|------------|----------------------|------------------|---------------|-------------|-----------------------------|---------|------------------------------|--------|-----------------------------|
| | Milk, lbs. | Ave'ge test, per ct. | Butter fat, lbs. | | Butter fat. | Skim milk, 15c per 100 lbs. | Total. | Gain. | Loss. | |
| 20 | 9,116 | 4.21 | 383.7 | \$32.80 | \$60.88 | \$12.29 | \$73.17 | \$40.37 | ..... | .085 |
| 7 | 7,015 | 4.43 | 310.8 | 30.61 | 49.26 | 9.46 | 58.72 | 28.11 | ..... | .098 |
| 15 | 6,509 | 4.27 | 277.9 | 29.20 | 43.89 | 8.70 | 52.59 | 23.39 | ..... | .105 |
| 1 | 5,904 | 4.62 | 272.7 | 31.06 | 43.65 | 7.97 | 51.62 | 20.56 | .... | .114 |
| 6 | 6,269 | 4.09 | 256.4 | 29.95 | 40.56 | 8.44 | 49.00 | 19.15 | ..... | .113 |
| 3 | 5,864 | 3.99 | 233.9 | 28.93 | 37.04 | 7.91 | 44.95 | 16.02 | ..... | .123 |
| 10 | 6,580 | 3.51 | 230.9 | 30.79 | 37.16 | 8.87 | 46.03 | 15.24 | ..... | .133 |
| 17 | 5,236 | 3.97 | 207.8 | 28.83 | 32.92 | 7.07 | 39.99 | 11.16 | ..... | .138 |
| 18 | 5,023 | 4.12 | 206.9 | 28.97 | 32.69 | 6.78 | 39.47 | 10.50 | ..... | .139 |
| 11 | 3,475 | 5.14 | 178.6 | 25.24 | 28.16 | 4.68 | 32.84 | 7.60 | ..... | .134 |
| 19 | 3,913 | 4.14 | 161.9 | 27.27 | 25.41 | 5.27 | 30.68 | 3.41 | ..... | .168 |
| 5 | 3,583 | 3.79 | 135.7 | 26.75 | 21.39 | 4.83 | 26.22 | ..... | \$0.43 | .197 |
| Ave'ge | 5,707 | 4.17 | 238.1 | \$29.20 | \$37.75 | \$ 7.69 | \$45.44 | \$16.25 | ..... | .122 |

Price of butter fat per pound: January, 17½ cents; February, 17 cents; March, 16½ cents; April, 15 cents; May, 14½ cents; June, 13 cents; July, 13½ cents; August, 15½ cents; September, 16 cents; October, 18 cents; November, 18 cents; December, 17 cents.

Cost of feed, per 100 pounds: Corn meal, 55 cents; Kaffir corn meal, 55 cents; linseed meal, \$1.25; soy bean meal, \$1; cottonseed meal, \$1; bran, 55 cents; alfalfa, \$4 per ton; ensilage, \$1 per ton; pasture, 75 cents per month.

HOW TO GET THE AGRICULTURAL EXPERIMENT STATION BULLETINS.

The pamphlet bulletins of the Kansas Agricultural Experiment Station are sent, whenever they are issued, to the addresses on the mailing list. Any farmer may have his name put on this list by writing to the station. Bulletins already published may be had on application. A list of these is usually found on each bulletin. The last one (No. 81), on "Feed and Care of the Dairy Cow," has been widely called for. At this time of the year some very short extra bulletins are being sent out, containing information which farmers ought to have right at this time. Among them is one on soy beans, a highly valuable new drouth-resisting crop; also one on fattening hogs on alfalfa hay and Kafir corn together. The discoveries explained in these last two bulletins may be of priceless value to the farmers of Kansas. Names may be sent in to the Kansas Experiment Station, Manhattan, Kan.



LOCAL NOTES.

M. V. Hester, '94, writes from Haviland, Kan., that his appreciation of his alma mater is constantly growing as the years roll by.

The Ministerio de Agricultura of the Republica Argentina has written to the College asking for the bulletins issued from the Experiment Station, and proposing to send us those issued by their department.

M. H. Horn, former member of the present Senior class, visited College, April 7, on his way home from Topeka, where he has been attending medical college. He expects to begin practising in Mitchell county this spring.

The members of the classes in domestic science work have organized a Domestic Science Club. The new society meets every two weeks. It has a good attendance and will undoubtedly become a fixture at the college.

MARRIED.—Harry Benson Gilstrap, '91, and Harriet Adelaide Patrick, at Stillman Valley, Ill., April 9. The young people will be at home in Chandler, Oklahoma, where Mr. Gilstrap is engaged in the newspaper business. We congratulate the young couple upon their happy union.

Professor and Mrs. Weida will be at home, Saturday evenings, for a few weeks, to meet the members of Dr. Weida's classes of the last winter term. A definite evening will be set for each of the classes; and the students may call at any time between 8 and 11 o'clock of the evening named. Professor Weida's residence is the first south of the college grounds, on Manhattan avenue.

Two young Armenians were enrolled as students of this College, April 17. They intend to pursue postgraduate work for a number of terms to improve the methods of practical farming in their native countries, Turkey and Asia Minor.

During the first ten days of the spring term the Bookstore department sold to the students books and stationery amounting to \$539. This sum does not include the department transfers, which amount to about one hundred dollars.

Miss Ella Weeks, special art student at this College in '97, has our thanks for a copy of the University Bulletin on "Alfalfa, Grasshoppers, Bees: Their Relationship." The publication owes much of its beauty and usefulness to the artistic pencil of Miss Weeks, who has been illustrator at the university for the past two years.

The eleventh biennial report of the State Agricultural College has been received at this office, and if every citizen in this state would examine this report and inform himself concerning the splendid work now being accomplished at this College, since its reorganization and renovation, he would become a warm, firm friend to this great Kansas institution of learning.—*Pratt Union*.

MARRIED.—April 11, at the home of the bride at Kansas City, Kan., Mr. Frank Davis Tomson and Miss Tina Louise Coburn. Both parties have been students at this College, Miss Coburn graduating with the class of '91. Since her graduation she has been an efficient assistant to her father, the secretary of the State Board of Agriculture of Kansas. The happy couple will live at Cedar Rapids, Iowa.

The faculty social for March was held at the residence of Professor Walters. Notwithstanding the bad roads, there was a large attendance, and all seemed to enjoy themselves very much. A chief feature of the entertainment consisted in the musical program of the college mandolin club and the piano recitals of Miss Bertha Jaedicke, of Hanover, Kansas, a graduate of the Scharwenka Musical Conservatory of Berlin, Germany.

During the month of March the Veterinary department distributed, free, to the farmers of Kansas, blackleg protective vaccine sufficient to inoculate between 8265 and 16,530 head of cattle with double vaccine. Up to the time of writing, favorable results only have been reported. To this there was one apparent exception, where the owner of 47 calves did not follow directions but pursued a method that he thought was "just as good," and as a result lost ten of his best animals.

The Olathe *Tribune* speaks of the ex-superintendent of the School for the Deaf in the following manner: "A. A. Stewart and family left, Saturday last, for Manhattan, their former home. They carry with them the kindest wishes of a host of friends for health and prosperity. They are excellent people and we much regret to have them leave our community." Mr. Stewart was at one time a member of the faculty of the Kansas State Agricultural College. What is Olathe's loss will be Manhattan's gain.

J. A. Conover, '98. who does assistant work in the Farm department, had a very narrow escape from serious injury at the barn on April 10. He went into the yard, caught a two-year-old Guernsey bull and led him out thru the gate, and as he turned to close the gate the bull caught him with his horns, throwing him to the ground. As the bull backed up for another charge, Conover scrambled thru the gate and closed it, thus avoiding further injury. Mr. Conover was badly bruised, but it is expected that he will be out again in a few days.

BULLETIN ON COLD STORAGE.—The College is receiving many requests for information on the subject of cold storage for keeping fruits. As many fruit growers already know, the College has been experimenting along this line for some time, and has obtained some very definite results. This information is soon to be distributed in the form of a bulletin on "Cold Storage for Fruit." This is the first bulletin to be issued in the United States on this important subject, and will be widely read. Send your request to the Horticultural department of the College and obtain a copy.

The local editor had the great pleasure, on April 15, of attending a dress parade of the college cadets. The battalion, including the band, numbers 211 members. The late trouble with Senor Sagasta prevented the government this year from detailing an officer to the College, but the battalion, under the care of Acting-Commandant Robert B. Mitchell, formerly a member of the Twenty-second Kansas volunteers, is doing excellently. The College has never had a better and more effective Military department. Mr. Mitchell is a member of the present Senior class. The next *INDUSTRIALIST* will give the names of the commissioned and noncommissioned officers of the battalion.

The Agricultural College will have two new buildings before the close of another year—an agricultural hall and a large additional mechanical engineering shop. Yet there are several departments so poorly provided with suitable class rooms and laboratories that the legislature must be asked to open its purse again. Most of all, we need a new building for the departments of Chemistry and Physics. Let all patrons and friends of the College, and especially all old students and alumni, consider this as the main thing to be worked for at the next session of the legislature, and let the good work of agitation begin at once whenever and wherever there is a chance. We must have a new laboratory.

Whatever may be the matter with Kansas, when it comes to experiment stations she is most emphatically all right. Their last bulletin, which, by the way, is only a single 6 by 9 sheet of paper, contains enough information to make the fortune of any man who is now losing one by means of his cows. And, according to the bulletin, there must be many who are losing money in that way. Eighty-two herds in one of the leading dairy sections of Kansas averaged only \$19.79 worth of butter fat for the year, while a herd of the same cows managed by the station turned in \$37.75 for each and every cow. What made the difference? [Here follows a reprint of the bulletin issued by the Farm department.]—*Nebraska Dairyman*.

As we go to press, the news comes from Guthrie, Oklahoma, of the death of a veteran "maker of the Agricultural College," Rev. J. E. Platt. The professor, as he was called by old and young, was a member of the faculty of this College from 1864 till 1883, teaching elementary English and mathematics. For many years he was also teacher of vocal music, and secretary of the faculty. Since '83 he has been organizer of Sunday school work for the Congregational church in Kansas and Oklahoma. Rev. Mr. Platt was a kind neighbor, a model citizen, an enthusiastic teacher, and a never-tiring evangelist. He will live in the memory of hundreds of students as a man of pure thoughts and good deeds.

The legislature of Kansas has appropriated \$110,000 for the Agricultural College. Of this, \$34,000 is to be used in the establishment of a dairy school—\$25,000 for a building, \$6000 for equipment and \$3000 for a dairy herd. For farmers' institute work, heretofore carried on by the College without help from the state, \$2000 is set aside. The agricultural interests of Kansas are to be congratulated. With the money now available, the farmers' institute work can be properly developed, the young men and women connected with the rapidly expanding dairy industry can secure instruction without going outside the state, and agricultural education in every way will be advanced. The present faculty at Manhattan is doing good work and deserves this recognition.—*Orange Judd Farmer*.

Mr. Guy F. Farley and Miss Nellie Roberts were married at the home of the bride's mother, Mrs. L. S. Roberts, Rev. Mr. Cullison officiating. A number of invited friends witnessed the ceremony and enjoyed the refreshments and entertainment which followed the same. Both of these young people are well known to the majority of our readers and both have the high esteem of a large circle of acquaintances. Mr. Farley is a graduate of the Kansas State Agricultural College, and a good business manager. He is a son of Mr. and Mrs. Joel Farley, a family among our wealthiest farmers. Miss Roberts is a cultured, refined young lady, daughter of Mrs. L. S. Roberts, a well-to-do widow living just west of town. We wish them a happy and prosperous wedded life. Mr. and Mrs. Joe Farley will give a reception to invited friends and relatives at their country residence, welcoming the young people home.—*Melvorn Review*. THE INDUSTRIALIST joins heartily in the well wishes for the happy couple.

THE STUDENTS' FARMERS' CLUB.—One of the most interesting and instructive organizations connected with the Kansas Agricultural College is a farmers' club composed of students interested along agricultural lines. This club meets weekly, and has a membership of about seventy-five names. Subjects pertaining to the farm, as soil, grain, stock, dairy, horticulture, landscape gardening, veterinary science, botany, entomology, chemistry and even domestic science are discussed. These discussions bring out points of great value to the young man who expects to return to the farm. At times the club secures the services of some veteran farmer or agriculturist outside of the College to discuss some special subject.

During the present school term the programs have been arranged with a view of devoting one evening each to certain phases of farm work. For instance, one evening will be devoted to grain growing, another to beef cattle, others to horticulture, domestic science, chemistry, botany, bacteriology, dairy, etc.—*Mail and Breeze*.

The legislature, which has just adjourned, has been far more liberal with the Kansas State Agricultural College than previous legislatures. An appropriation of \$111,000 was made. The nearest approach to this amount was made in 1892, when \$75,000 was appropriated for Science Hall. The Agricultural department received a total appropriation of \$34,000, \$25,000 of which is for a new dairy building, and the remaining \$9,000 for equipment and a small dairy herd. Professor Cottrell says the building will be ready for the students at the opening of the fall term in September. The plans are already drawn for the building, and work on its erection will begin as soon as the regents decide upon a location. This will give the Agricultural College a first class dairy department which will prove a valuable acquisition and an encouragement to the growing butter industry of the state. Professor Cottrell is an efficient and energetic man and under his direction the new department will immediately outrank any dairy school in the West. Two thousand dollars was also appropriated yearly for farmers' institutes. This is the first time that an appropriation has ever been made for this purpose. This winter the College has held 62 farmers' institutes, using college funds, and has declined 130 invitations to help dairy institutes. With the new appropriation it will be enabled to conduct from two to three institutes in every county of the state.—*Manhattan Mercury*.

SOW ALFALFA.—Every farmer who has fed alfalfa recognizes it as a good feed, but a great many have not as yet begun to realize its full value, and do not know what they are losing by not having it as one of their main feeds. The results from giving alfalfa to dairy cows and fattening steers as a part of the feed compares very favorably with those from such expensive feeds as oil meal, cotton-seed meal, and bran, and in fact takes the place of those feeds in the ration. The Kansas Experiment Station is demonstrating also that alfalfa is an invaluable hog feed. A pound and a half of alfalfa a day per hog used with Kafir produces gains very nearly equal to a feed of one-fifth soy bean meal and four-fifths Kafir. And now is the time to begin preparing to sow alfalfa. A deep, loose seed bed is not what you want; but the ground needs to be moist, and for this we may have the required rainfall and we may not. However, the ground is wet now; and if you can keep that moisture there till the plant gets the good of it, there is enough, even without another rain before the first of June, to give alfalfa the best kind of a start. The ground to be put in alfalfa does not need to be plowed deep, but the surface three or four inches must be kept in the best of tilth. Disk or cultivate as soon as possible, and then harrow every week or so; or at least after every rain, to keep up a good earth mulch until it is time to seed. If at that time the surface three or four inches of soil is loose and moist, and there is a solid bed of moist soil underneath this loose surface, then it doesn't matter much, say many

extensive alfalfa growers, how you proceed to get the seed under the ground. We have had the best results on the Agricultural College farm by using a press drill, and mixing the seed with an equal weight of wheat bran. But the principal thing is to sow alfalfa, and sow it until you get a field.

APPRECIATIVE PRESS COMMENTS.

The appropriation of \$34,000 will enable the Agricultural College to make a splendid move in dairy work, and no man is better fitted than Professor Cottrell to place this feature upon a thoroly practical and scientific basis. The work already done by Mr. Cottrell is telling in every dairy county in the state.—*Junction City Daily Union*.

To the above just and appreciative remarks it may be added that the general attendance at the College during the last and present terms has been and is greater than ever before. And, besides the important improvements and progress above mentioned, the same general spirit of advancement has shown itself all along the line.—*Junction City Tribune*.

APPRECIATIVE WORDS FOR THE INDUSTRIALIST.

"I assure you I appreciate it."—*Mary N. Kirby, County Supt.*

"THE INDUSTRIALIST is an excellent magazine."—*L. A. Goodman, Sec. Mo. State Hort. Society.*

"I have found THE INDUSTRIALIST very helpful."—*L. C. Wooster, Kansas State Normal School.*

"I have been much interested in THE INDUSTRIALIST."—*Prof. Richard T. Ely, Director of School of Economics, University of Wisconsin.*

"The public library has made good use of it in the free reading room. We find it one of the best journals of its kind published."—*John Parsons, Librarian, Denver, (Colo.) Public Library.*

"THE INDUSTRIALIST is one of our best exchanges—always full of truth and instruction."—*Philosophian Review, Bridgeton, N. J.*

FARM NOTES.

Work on the farm is a month behind, on account of the season, but is beginning in earnest.

Pocket gophers began work in several fields very energetically on our first warm days, but since a potato containing a small quantity of crystallized strychnine was placed in each hole, they seem to have "rested from their labors."

The backwardness of the season will make little difference in the work this year, as it will be pure and simple farm work. The old line of plat experiment has been entirely dropped, and the crops to be put in will be handled in the most practical manner.

Wheat on the college farm is very badly frozen out. It will not pay to let any of it stand. Experimental acre, which has been in wheat for eighteen years continuously, has only a little fringe of green along the edges where the snow drifted. It will be disked and put in oats for a soiling crop.

Plans will be submitted to the regents at their next meeting for the feeding of not less than 600 head of hogs in the eight months beginning September 1. The feeds that can be raised in Kansas,

and the results of their various combinations, will be tested as to their flesh-producing qualities and the quality of pork they will produce.

The crops and the area devoted to each this year will be as follows: Kafir and soy beans, each 40 acres; sorghum, 15 acres; silage corn, 12 acres; millet, 10 acres; soiling crops, 10 acres. These crops will be planted, tended and harvested with the object of getting the most and best quality of feed possible, to be used in future feeding experiments.

We drop plat experiments because the results of our feeding experiments this winter have been so remarkable, have excited so much attention, and are being so corroborated in the minutest detail by repetition, that it is believed that the work of the Experiment Station, Farm department, which will be of the greatest benefit to the farmers of the state is in feeding and not in the field work.

DAIRY NOTES.

The college dairy recently received a couple of cream bottles from one of the leading creameries of the state to be tested. These bottles were graduated from 0 to 35. It was found that when these bottles would indicate 35 per cent of butter fat in cream the true test would be only $27\frac{1}{2}$ per cent.

Five of the boys from the dairy class had employment on entering the College, two remain to work in the dairy line at the College, five have received employment with creamery companies in the state, and six take up work on the farm where they will have a chance to exercise their dairy proclivities with both muscle and brain.

The Meriden Creamery Company, who sent two of its own men to the dairy school and who have recently employed two others among our dairy students, expects to develop the literary inclinations of the boys by having them publish a monthly bulletin on dairy topics which will be sent to each one of their two thousand patrons.

The Meriden Creamery Company asks for the list of questions that was used last summer by the Experiment Station in collecting statistics from creamery patrons. They expect to have each one of their skimming station men go out among the patrons of their respective stations, study the conditions as to feed and care of the dairy cow, and receive and offer suggestions for improvement.

The College is now the proud owner of nine grade Guernsey calves, six heifers and three steers. An interesting calf experiment has been under way since the first of April. After the calves are three weeks old their feed is gradually changed from whole milk to skim milk. The experiment consists of giving every alternate calf creamery skim milk and the remaining alternate calves college skim milk. The former is sterilized at the creamery and cooled upon arrival at the dairy. The latter is separated immediately after milking and is likewise cooled. In all cases a little Blachford's meal is added to the skim milk. The calves are supplied with fresh water and salt and all the Kafir-corn meal and mixed hay they will eat.

BOOKS AND PERIODICALS.

STUDIES IN COMPARATIVE THEOLOGY. Six Lectures delivered before the Students of Lawrence University, Appleton, Wis., by Rev. Geo. H. Trever, Ph. D., D. D., Milwaukee, Wis. Cloth, pp. 432, 5½ by 7½ in., \$1.20. Cincinnati: Curts & Jennings.

This book is a sign of the times, and fills a need of the times. It indicates growth and breadth in the religious life. The fact that such lectures were delivered, and the further fact that there should be a demand for their publication, is the best of evidence that our age is passing out of narrow and into broad religious fields. The book treats the religions of India—Vedism and Buddhism, the religion of Persia—Zoroastrianism, the religion of the Egyptians, the religion of the Hebrews, and finally compares each with the Christian Gospel.

D. J. H. W.

NORSE MYTHOLOGY; OR THE RELIGION OF OUR FOREFATHERS. Containing all the Myths of the Eddas, Systematized and Interpreted. With an Introduction, Vocabulary and Index. By R. B. Anderson, A. M., Professor of the Scandinavian Languages in the University of Wisconsin. Cloth, pp. 473, 5½ by 7½ in., \$2.50. Chicago: Scott, Foresman & Co.

Not too much shall we know concerning the religion of our ancestors, nor of the various sources which joined to make the religion which we ourselves profess. Among our many ancestral relatives are to be counted the Norsemen. Perhaps the greatest impulse toward the study of what we are pleased to call "Norse Mythology" was that given by Prof. R. B. Anderson of Wisconsin University. This work has been before the people upwards of twenty years, and is still regarded as a trustworthy and systematic account of the religion of these far off pioneers. It discusses the general topic of mythology, compares that of the Northmen with the mythologies of the Greeks and Romans, and gives the Norse theories concerning creation, life and its final regeneration. It is a useful and interesting book.

D. J. H. W.

THE AGE OF FABLE, OR BEAUTIES OF MYTHOLOGY. By Thomas Bulfinch. With notes, revisions and additions by William H. Klapp, Headmaster of the Episcopal Academy, Philadelphia. Nearly two hundred illustrations. Cloth, pp. xv-456, 5 by 7½ in., \$1.25. Philadelphia: Henry Altemus.

Fable and myth are not history, yet they are what remain in lieu of history at the dawn of "letters." As material for history they are valuable in so far as the facts can be extracted from them. They are also valuable as literature, being in themselves a delightful and unique type of romance. Never was the mass of this early "knowledge" so entertainingly and so well summed up as in Bulfinch's Age of Fable. But this was years and years ago. "So many discoveries have been made during the last forty years in the domain of art, literature, and archeology, that considerable changes were necessary to bring the book up to the present time and to retain or to enhance its usefulness." These have been made in the revised and augmented edition lately put forth by Mr. W. H. Klapp. It is now more valuable than ever.

D. J. H. W.

TENNYSON'S DEBT TO ENVIRONMENT. A study of Tennyson's England as an introduction to his poems. By William G. Ward, Professor of English Literature in Syracuse University, and in the Emerson College of Oratory, Boston. Cloth, pp. 100, 4½ by 6½ in., 50 cents. Boston: Roberts Brothers.

Lovers of Tennyson—the most representative poet of the Victorian age, “the God-gifted organ of the voice of England, who hath written lyrics that must charm all who love, epics that must move all who act, songs that must cheer all who suffer, poems that must fascinate all who think”—all who love this grand poet and his songs must read “Tennyson's Debt to Environment.” In this book William G. Ward outlines, first the man Tennyson; the place he filled in the hearts of the English people; the honor, reverence, respect paid this noble character when his day's work was finished.

The succeeding chapters treat of the poet's love of nature and the influence it played in the production of such poems as “The Brook,” “The Owl,” “The Lock,” etc. Romance, sorrow, success, etc., each fills an important mission in Tennyson's life and each bears a magical influence in the production—the outward expression of the inner soul—of some poems characteristic of the breadth of sympathy and nobility of his character.

Part 2 gives brief outlines of “Study of Minor Poems,” “In Memoriam,” “Idylls of the King,” etc. The closing page is a Tennyson chronological table. The little book is full of interest not only to the beginner but to those who already know and love Tennyson.

A. R.

THE MEANING OF EDUCATION AND OTHER ESSAYS AND ADDRESSES. By Nicholas Murray Butler, Professor of Philosophy and Education in Columbia University. Pp. viii-230, 7½ by 5 inches, \$1.00. The Macmillan Company, New York.

Professor Butler is everywhere recognized as one of the most scholarly and progressive writers on education. The collection of essays and addresses here given to the public in convenient form, and originally delivered before the National Educational Association and other educational bodies, deserves a place in the library of all who are interested in the improvement of American schools and colleges.

Professor Butler holds that he should attempt to give the child the inheritance of the race, physical, scientific, literary, esthetic, institutional and religious. “Each generation is the trustee of civilization; each generation owes it to itself and to its posterity to protect its culture, to enrich it and to transmit it.”

In one chapter the close relation between democracy and education is well developed. The greatest educational need of our time, in higher and lower schools alike, is declared to be “a fuller appreciation on the part of the teachers of what human institutions really mean, and what tremendous moral issues and principles they involve.” The safety of our institutions is found in “the enthusiasm born of intense conviction that finds the happiness of each in the good of all.”

The functions of the university, the college, and the high school, and the greatly needed reforms of the latter along the lines of the report of the famous Committee of Ten of the National Educational Association, are ably discussed.

E. W. B.

THE STUDY OF THE CHILD. A Brief Treatise on the Psychology of the Child, with Suggestions for Teachers, Students and Parents. By A. R. Taylor, Ph. D., President of the State Normal School, Emporia, Kansas. Cloth, pp. xliii-215, 4½ by 7 in., \$1.50. New York: D. Appleton & Co.

After a preface by the editor and a few words by the author in which philosophic child study is explained, this interesting book introduces the study of the child by a graphic illustration of the minuteness of the godly attributes in the babe and their unlimited possibilities of the development in the man. The organic senses presiding over the vegetative functions of the body are given a passing notice. The temperature sense is then taken up and cautions pertaining to the health of the child given for the observance of teachers. The education and formation of a cultured sense of taste, and a protection of the organs of smell, are subjects that no parent can afford to ignore. The author then discusses the delicate and wonderful sense of touch, and suggests methods for its development. The senses of hearing and sight are made the themes for some excellent advice to teachers. Ignorance of defects in some of the organs of special sensation may be the occasion for unintentional cruelty to pupils on the part of the teacher. In the discussion of the special senses, the author constantly emphasizes their psychological significance.

The subjects of consciousness, apperception, attention, symbolism and language are taken up and discussed in a manner that any intelligent person can comprehend. After a chapter on muscular and motor control, the mental faculties are taken up in due order. Observations of the outward effects of those internal mental states called feelings are suggested, from which valuable inductions may be made.

The will is next noticed, and finally the intellect and its functions of perception, memory and imagination.

As the child grows up to maturity, the intellectual functions of conception, judgment and reason become developed. "When a child, he ought to be permitted to think and reason as a child." The author notices the physiological side to reasoning, and gives a few elementary syllogisms for the use of the teacher. Instincts and plays of children are discussed with reference to the formation of character, and the social qualities, manners and morals resulting from a proper direction of the instincts.

A chapter is devoted to the care and handling of normals and abnormals, or defectives, and is followed by a discussion of the physical stages of growth and the fatigue point. A bibliography of four pages closes this interesting and instructive book.

G. L. C.

ECONOMICS. By Edward T. Devine, Ph. D. Pp. vi-404, 7 by 5 inches, 1898, \$1.00. Macmillan Company, New York.

This work by the general secretary of the Charity Organization Society of New York city, but recently fellow in the University of Pennsylvania, and university extension lecturer in Pennsylvania, should rather be entitled "Some Phases of Economic Theory," since it is not really a treatise on the science as a whole.

The book presents some of the latest conclusions on the influence

of environment on industry, the nature and conditions of social prosperity, and other subjects. In most text-books the student is informed at the beginning that a society is truly prosperous when its climate, soil, etc., are favorable, and when living is cheap and easily obtained and the people are progressive; but the attention is at once diverted to the study of value until it appears as if the real prosperity of a people depended upon such limitations in the supply of desirable goods as to make them of great exchange value. Doctor Devine, on the other hand, does not touch value until page 154, and admirably sums up a rational review of the subject in these words:

Consumers as a class are concerned that there should be great utility and little value; producers, that there should be great value and little cost; society, as a whole, that there shall be great utility and little cost.

Nowhere has the relation of extensive public education and state universities to the economic life of the people been better shown than in a few passages of this book. For example, it is clearly proved that the discovery of some new mechanical processes or some other improvement in the arts and industrial processes making possible a higher level of living for all because of a cheaper cost of the necessities of life will redound to the advantage of shrewd monopolists and unscrupulous dealers, while wages will fall with the cheapened cost of living, unless the worker has been influenced by his education and environment to demand a higher and ever higher standard of living.

Again it is shown that the sons of the rich and the well-to-do enjoy a monopoly of opportunity for the development of their talent and intellectual powers, and consequently have monopoly earnings from such developed skill, unless not only elementary education but high school and university opportunities are fully opened to all by the state. Public irrigation or drainage, as circumstances may require, and the planting and care of forests by the state are shown to be of great social advantage in permitting great increased yield of agricultural products without the rise in prices and rents made necessary by the ordinary method to cover the initial risks and expense of private action in these matters.

A great defect in American farm life is pointed out in the location of farm houses remote from one another instead of in small villages along a good highway, as thruout Europe. In fact the book is full of helpful thoughts and suggestions; but, in endeavoring to cover a wide field, this small work is obliged to neglect many portions and to give very inadequate space to others. Imagine, for example, a treatment of the money question without any reference to the causes or effects of rising or falling prices. But considered as a series of essays on utility, value, environment and consumption, rather than on economics as a whole, this work of Doctor Devine, who acknowledges his great debt to his teacher, Professor Patten, will be of real service to the student.

E. W. B.

ADVANCED METAL-WORK. Lessons on the Speed-Lathe, Engine-Lathe, and Planing-Machine. For the use of technical schools, manual-training schools and amateurs. In three parts. Part I. The Speed-Lathe. By Alfred G. Compton and James H. De Groodt. Cloth, pp. v-134, 5 by 7½ in., \$1.50. New York: John Wiley & Son.

The April *Overland* contains several articles of more than passing interest and value. Among these is a paper by Dr. John S. White, of the Berkeley School of New York, on the requirements for admission exacted by American colleges.

Miss Tarbell relates in *McClure's Magazine* for April the story of Lincoln's attitude and conduct in reference to emancipation, giving much new reminiscence of Lincoln by Charles Sumner, Carl Schurz, and other of Lincoln's close friends.

Cooking, in its every-day phases and also as a fine art, is among the attractions always held out by *Table Talk*, and in the April issue the recipes, the menus, and the notes on serving and table decoration, are of special interest to housekeepers.

To *The Youth's Companion*, for the week of April 27, Surgeon-General Wyman, U. S. A., contributes an article entitled "Maritime Quarantine," in which he describes the precautions which the government takes to prevent infectious and contagious diseases.

Miss Maria Parloa, the well-known household economist, will hereafter write exclusively for *The Ladies' Home Journal*. Beginning with the May issue Miss Parloa is to conduct a department on the care, etc., of the home, and home work. Miss Parloa is regarded as the highest authority on her branch of domestic science.

Bright and welcome as the spring it symbolizes is *Outing* for April, laden with the season's pleasures from "The First Strike" on its frontispiece, to its concluding poem, "When the Brook Trout Leap." The new life of the year, the glory of the budding woods, the trill of the songster, the purr of snow-fed streams, the whirr of the liberated cycle, are all reflected in its pages.

Major-General Merritt contributes the leading article, entitled "Our Flag in the Philippines," to the April number of *Frank Leslie's Popular Monthly*. General Merritt's comments on the present operations in the Philippines, and upon the outlook for the establishment of our military control there, are decidedly optimistic and make first-class reading, which is enhanced by profuse pictorial illustration.

Under the title "The Face of Christ in Art," an interesting collection of opinions of noted clergymen of many denominations has been made by Mrs. Wade Hampton, jr., in reply to the question, "Is the Portraiture of Jesus in Art, Strong, or Weak?" The article is illustrated with careful reproductions of many famous art pictures of Christ. It forms a peculiarly appropriate feature for the April magazine number of *The Outlook*, as that is the Easter number.

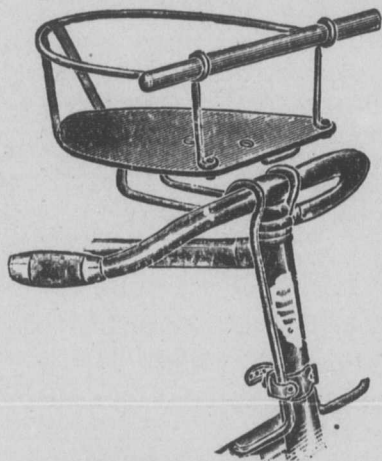
The musical features of *Ev'ry Month* for April are varied enough to suit any taste. A beautiful and plaintive "Ave Maria," by Paul Dresser, shows that he can not only write the most popular song of recent years, but can compose sacred music of a very high order. "A China Heart," a humorous ballad, supplies the lighter element, while "Virginia Capers," a cake-walk and two-step, will irresistibly compel the feet of the listener to tap in time to its characteristic movement.

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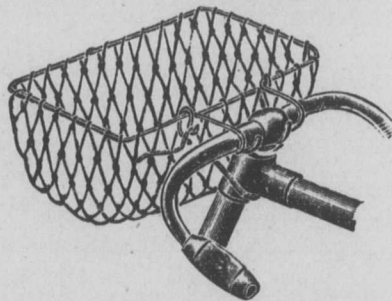
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"PLEASED WITH ITS COMPACTNESS AND VALUE."

CHICAGO, Ill., Aug. 18, 1898.

Mr. Chas. S. Davis, Supt.,
Ptg. Dep't, K. S. A. C.,
Manhattan, Kansas.

DEAR SIR: We are in receipt of your "Stylebook and Manual of Typography," and are very much pleased with its compactness and value. We think your article on type bodies covers the subject very thoroly. You are right in your statement that the destruction of Marder, Luse & Co.'s old punches in the Chicago fire of '71 was really the first impetus to the adoption of the new system [of type bodies], which Marder, Luse & Co. had had in contemplation some time.

Yours truly,

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The writer acknowledges, with thanks, the receipt of a copy of a "Stylebook and Manual of Typography Governing Composition and Proofreading," from the Printing department of the Kansas State Agricultural College. The work was authorized by the Board of Regents and was done by Charles S. Davis, superintendent of printing. All who know Mr. Davis understand that it is well done. It is a carefully compiled manual of twenty pages that gives abundant specific information on all matters within the scope of its title. It is compiled from the highest authorities on all topics treated, and ought to be in general use in printing offices. Price, 10 cents.—*James P. Easterly, in Eureka Union, Aug. 19, '98.*

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In ordering several copies of the K. S. A. C. Stylebook, Henry R. Boss, for the publishers of the Stylebook of the Chicago Society of Proofreaders, says: "There is much that is admirable in your work. We are especially gratified at the stand you take on the question of spelling. In this work your book will render important aid."

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Manhattan, Kan.

DEAR SIR: I consider your "Stylebook and Manual of Typography" one of the most complete and accurate guides to both compositor and proofreader. There are, of course, in this pamphlet, as in all other works of the kind, a few rules not acceptable to every one, such as those relating to compound words, etc., yet one would not go far astray to follow it in toto. It is just such a work as should be found in every office; then, if followed, what a wonderful improvement would soon be seen, especially among our country weeklies.

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The Kansas State Agricultural College Printing department has just issued a "Stylebook and Manual of Typography." It covers 16 pages and takes up and treats thoroly the subjects. It is intended, we presume, to be used principally as a text-book in the Printing department. The booklet will be valuable in any printing office.—*Junction City Union.*

"A FONT OF USEFUL INFORMATION."

This office is under obligations to Charles S. Davis, superintendent of printing at the State Agricultural College, for a copy of the "Stylebook and Manual of Typography" recently issued from the College Press. To a beginner and even to an "old hand" the little pamphlet is of great value as a refresher of memory, a book of reference and a font of useful information. Having educated several typos, we have often felt the need of just such a little book to put into the hands of the beginner to study and be guided by. The price of the little book is 10 cents.—*Le Roy Reporter, Aug. 26, '98.*

"HAVE REFERRED TO IT MANY TIMES."

ANN ARBOR, Mich., Feb. 16, 1899.

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Kansas State Agricultural College.

MY DEAR SIR: Please pardon me for not thanking you before for the "Stylebook and Manual of Typography" sent. I have referred to it many times and expect to many more.

My idea has been to make a style sheet that would be adaptable to the University of Michigan publications, of which there are nearly a dozen, including a daily, weekly, semi-monthly, two monthlies, etc. My sheet will be arranged on a slightly different plan than any other I have seen. When it is in proof, which may not be for some time yet, I will mail you a copy. That will best illustrate my ideas on the subject. Under another cover I have mailed you several copies of the *University News-Letter* on which I have been doing some work.

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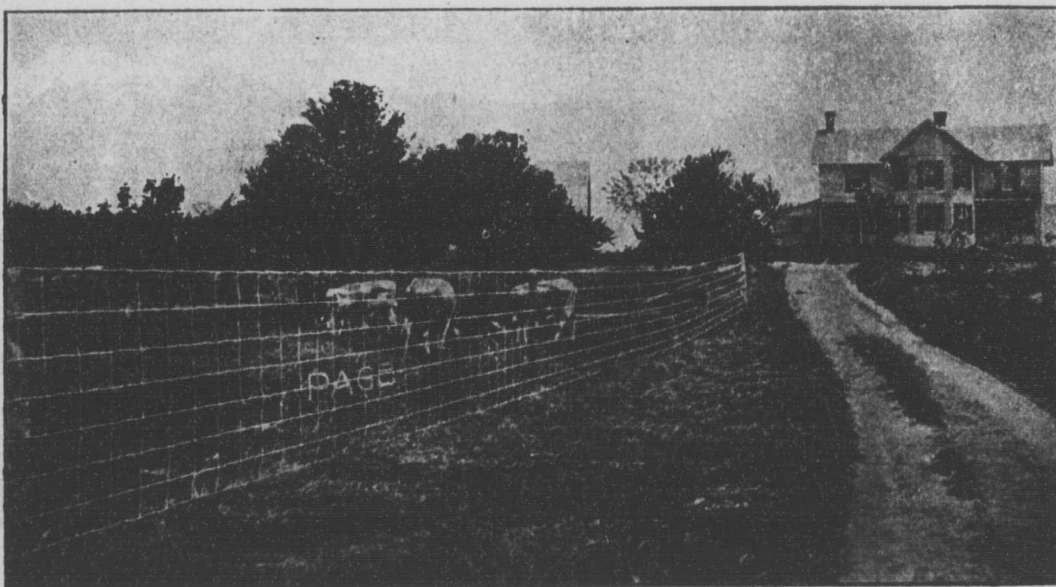
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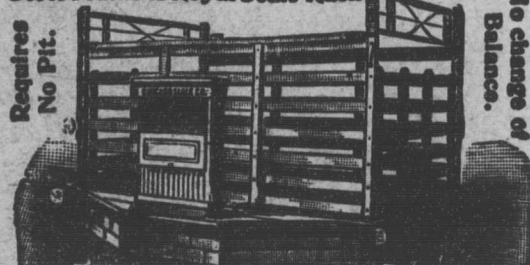
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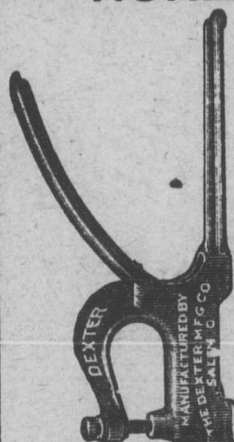
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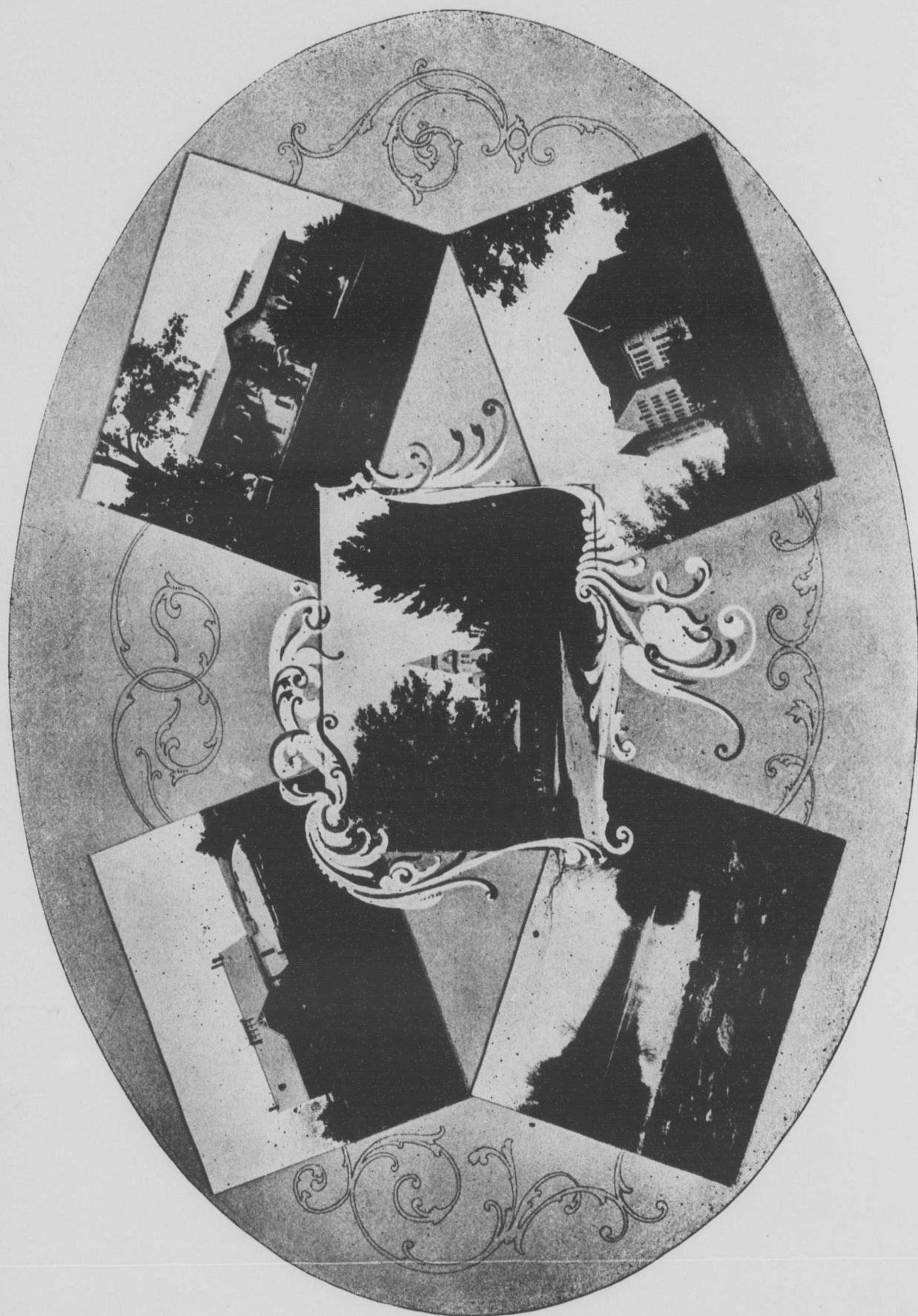
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PRACTICAL VERSUS THEORETICAL METHODS.

BY ARNOLD EMCH.

NOUS VOYONS CHAQUE JOUR COMMENT L' APPLICATION DES DOCTRINES SCIENTIFIQUES À L' INDUSTRIE ACCROÎT CONTINUUELLEMENT LA RICHESSE ET LA PROSPÉRITÉ DES NATIONS.—*Berthelot.*

THE time has passed when scientific and technical discoveries are made by mere accident. A planless experimental method may be successful, sometimes, but it would surely indicate a state of degeneration if the spirit of such crude investigation should be introduced into higher institutions of learning. There is no danger, however, that such a thing will happen, altho some of the so-called practical people are not satisfied if they cannot recognize agricultural implements or statistical tables in geometrical figures and analytic formulas.

A modern college must have an industrial character. It must teach agriculture, mechanics, engineering, architecture, chemical technology, household economics, sociology, etc., from a scientific point of view and by laboratory methods. The introduction of refined methods in teaching is always one of the principal aims of a progressive school.

Take as an example the teaching of mechanics. In this science, to which all modern improvements in machinery and building are due, it is not sufficient to study and discuss the physical properties of metals and other materials and their transformation into wheels, rods, bricks, and so forth. The laws of motion and of equilibrium must be studied also. The nature of these laws in its refined form is mathematical, so that their investigation requires considerable knowledge of geometry and analysis. A true engineer, who is familiar with the mathematical treatment of dynamic and static laws, will build more intelligently and more economically than the one who has to depend exclusively upon the knowledge gained by experience and from the catalogs of manufacturers. It is true that some of

the mathematical methods are very tedious and clumsy, and that the engineer tries to get along without them, if he can. This defect, however, is not due to the failure of mathematical applications; it is due to ancient methods and antiquated teaching. In England and some other countries a mistake is made in the very first grades of the high school. The "soul-destroying systematization of Euclidian methods must be followed to the weariness of the boy's mind and the quenching of his interest." Months are occupied in attaining the 12th proposition of the first book, while a boy of ordinary intelligence could master those propositions in a few days, if he were taught by modern methods. The same is true with regard to the mathematical teaching of the majority of colleges and academies. The correlation of geometry and algebra, of graphics and analysis, and of mathematical and physical science in general, is but insufficiently developed before the mind of the student. While England is making strenuous efforts to improve her technical teaching in order to meet the tremendous industrial expansion of Germany, this country is rapidly progressing along the same line. As in Germany and Switzerland and other continental countries, the industrial progress of the United States should be considered as a result of higher education. Mr. von Bülow said in the German Reichstag that the success of manufactures and commerce was due to the standard of the work of polytechnics and universities. This indicates clearly what shall be done in such institutions: it is evidently the raising of the scientific standard, and the improvement of teaching, libraries and laboratories.

No stagnation in methods and investigation can be allowed, because new facts in science will always find their application. Thus, graphic statics has its origin in the application of projective geometry to mechanics. Projective geometry is a creation of this century and is connected with the work of such illustrious men as Steiner, Poncelet, Chasles and v. Staudt. Based upon the principles of projective geometry, in 1868, Professor Culmann in Zürich published his epoch-making work on graphic statics. The practical value of this science is best illustrated by a remark of the French engineer Eiffel, who at the opening exercises of the World's Exposition of Paris in 1889 said that he never would have been able to build his gigantic tower if he had not studied graphic statics at the Polytechnic of Zürich.

The historic development of physics and chemistry and of natural

science in general presents similar examples. When Fourier announced his great discovery of the development of a function into trigonometric series and their connection with the conduction of heat, no practical physicist attached much importance to this theory. To-day it can be said that the solution of a great number of practical problems concerning the conduction of heat and electricity has been accomplished by the aid of Fourier's series.

The most universal law of nature, the conservation of energy and matter, which for a long time was so very objectionable to certain theologians and philosophers, and whose origin may be found in purely metaphysical speculations, has revolutionized physical and chemical science. Even at the present time new theories are developing under the predominating influence of this law. In this manner, the kinetic theory of gases has been established, by which the physical properties of gases, and also of fluid and solid states of matter, can be explained by mechanical laws. It is this conception which directly or indirectly has led to the discovery of a number of new elements, like helium, argon, and recently etherion, and the liquefaction of all gases. The reversible process implied by the law of the conservation of energy and matter (the law indicates no dualism between energy and matter; there is no energy without matter and no matter without energy) has been applied in the most beautiful manner in the ice-machine. Liquefied air, which for years was only of theoretical interest, is now used for different purposes, as, for instance, in the drilling of the Simplon tunnel in Switzerland.

Crystallography is evidently a true science. Its objects may be found in nature, exclusively, and the crystal forms are carefully defined and described in a number of admirable systems. It is well known, however, that, on account of the infinity of nature, the best geologist cannot find everything in his excursions which by scientific induction is possible to exist. The best classification of crystal forms was obtained by a geometrical method, the method of groups, which is of the greatest importance in modern mathematical research. All regular configurations in space are characterized by group properties. Rotation, Translation and Reflexion form the elements of these regular arrangements of points in space. By this method it has been found that there are 32 classes of crystals while in reality only about 28 classes are known in crystallography.

A great number of examples of this kind and probably a greater number from the realms of biology might be added which, in the

same manner, would show the necessity of upholding the standard of true scientific investigation.

Certain theories may seem abstract, indeed, and it cannot be denied that some of them, originating from one-sided quarters, will never be of intellectual or material value to mankind. On the other hand it must be remembered that the course of scientific research is always rectified by practical possibilities and limits. Theory cannot develop rationally without the wholesome influence of practise, and vice versa. Many people are one-sided in one or another direction. Some favor fanatically old practical methods of teaching and research, others are hypercritical and are led to theoretical extremes. But the majority of competent educators and scientists know that true progress in science and its application to the great problems of organization, of agriculture, commerce and traffic can only be made by the combination of practical and theoretical methods.



STUDENTS AT WORK IN THE GARDENS.

BIBLIOGRAPHY OF LITERATURE ON PLANT BREEDING.

BY GEORGE LEMON CLOTHIER.

THE following references have been selected chiefly because they throw light upon some of the problems entering into the seed-breeding experiments now in progress at the Kansas State Agricultural College. The writer takes this opportunity to express his obligations to Prof. L. H. Bailey and the Rural Publishing Company for permission to use Professor Bailey's excellent bibliography of "Cross-Breeding and Hybridizing," which will appear in its proper sequential place.

The citations have been classified under the three general headings of plant variants, technology, and philosophy of plant breeding. The chief plant variants are food supply, climate and crossing. Food supply will be treated under the subheadings, the seed, the soil, fertilizers and graftage.

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(To be continued.)

CONSEQUENCES OF THE REFORMATION.*

A Historico-Literary Study—Reflections for Later Times..

BY DUREN J. H. WARD.

LONG before the time of Luther, Church and State had become thoroly assimilated in every political body of Europe. Every institution was blended in its very nature with the church, and Europe was well-nigh in the bonds of an absolute theocracy. To such an extent had this assimilation gone on that a shock of the doctrine of the Church could not fail to convulse society in every part. The pope asserted a two-fold subjection of every soul in Christendom—as spiritual head dominating thru the hierarchy; indirectly as temporal head swaying the kings of nations by the Holy Roman Empire. The feeble monarchs of France, England, Sweden, Denmark, and the princes of the small states and free cities of Germany, had for centuries made but an ineffectual resistance to papal encroachment. But at the beginning of the sixteenth century, a change brought about by the growth of a more national spirit presented a formidable front to the tiara which was now become dizzy by its long successful ascendancy.

Altho the Reformation is a great and dominant cause in modern history, it must not be forgotten that, like all other events, it was itself an effect of previous causes. It is but an arc of the ever-aspiring human ideal approaching the moral asymptote; it is but one mighty throe of writhing and struggling humanity to free itself from the tyranny of moral bondage; it is but one of the continued succession of reformations in the progress of civilization, some—indeed most of them—are silent and slow, this one loud, quick, powerful and brilliant. The fuse that was lighted in the mind of Wiclif burned on and on, till, reaching a magazine in Luther, it rent the world of superstition by an explosion which threw the light of knowledge over all succeeding ages.

The two objects most dear to the heart of man are the maintenance of his social rights and the independence of his religious opinions—liberty of civil action and liberty of conscience. They nearly equal the sum of existence. His enthusiasm knows no limits at the hope

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of their recovery; his despair is unfathomable at the prospect of their loss. Such hope and prospect stared in the face the nations of Europe at the beginning of the sixteenth century. The flood of ignorance which the barbaric inundation swept over the already diluted mind of southern Europe left a solution so weak as scarcely to contain a crystal of improvement. Gradually, as the reagent of time did its work, the scanty knowledge crystallized in the form of a dull scholasticism in the cloisters of monks. For centuries, "study was rendered as inaccessible as possible to the laity: that of ancient languages [except Latin] was treated as a monstrosity and an idolatry." "Roman Catholicism was diametrically opposed to the progress of knowledge." (See Villers, "Spirit and Influence of the Reformation," pp. 89, 186.) But day infallibly follows night. The sun of knowledge must arise. Its light reveals the ridiculous garb and antics of men in mental darkness. The irrepressible tendency to know was rapidly giving itself the means in the newly founded universities. The unveiling of a new world had piqued inquisitiveness, and the discovery of the art of printing had furnished the means of its gratification to millions. From the banks of the Vistula, Copernicus had spied out the courses of the heavenly orbs, and Kepler and Newton afterward furnished their laws, neither of which have pontifical bulls been able to revoke.

Not a little fuel was added to the fire of excitement by the keen satires of Erasmus of Rotterdam. His mirth-making book, "The Praise of Folly," was directed against the sensuality and stupidity of the clergy. Ulrich von Hutten, a young Franconian nobleman of ardent spirits and fine ability, warrior, poet, theologian, and literateur, heaped mountains of ridicule upon the clerical body by his "Letters of Obscure Men."

At this period of the drama there came upon the stage one of the foremost actors of all history, Martin Luther, a monk, priest, doctor of theology, and professor in the new university of Wittenberg, a man of tremendous earnestness, undaunted courage, immovable firmness, moral uprightness, and warmly devoted to the study of the "New Learning." To the reflecting student of history, what momentous consequences hang upon the character of this man! Had the papacy been more prudent, had the princes of Germany been more indifferent, had Luther been less inflexible, the child of Protestantism might have been strangled in its cradle. So easy is it to doze away life, what but such fortuitous

combination of circumstances could have saved Europe from the calamity of a universal monarchy or the superstition of poor benighted Spain!

Speaking of the state of the European mind before the Reformation, Mr. Froude says:

The theories and ceremonies of the Catholic Church suited well with an age in which little was known and much was imagined; when superstition was active and science was not yet born.

But times change. These ceremonies were not living, but dead. Religion had lost its hold on the people. The people saw that the prelates did not believe their own teaching, and why should they? But could not an infallible Church have improved things? It might indeed, but reform was the last thing which it wanted. It tried (but too late) to cover its errors and rally its decaying energies. Twenty-five years after the explosion at Wittenberg, a solemn conclave of theological dignitaries at Trent voted the doctrines of heavenly truth (?) and supported them by the invincible arguments of fire and fagot. But the spirit of liberty and independence which had burst open the gateway of superstition had fled so far and gained so many adherents that its recall was now ludicrous. In vain did pope and bishop in bigoted seclusion thunder their protests and proscriptions. And since the dawn of reform, bulls of anathema have issued from Rome against every published work of doctrine, philosophy, science, history or general literature which could be supposed directly or indirectly to counteract popish assertions or curtail popish authority. A single illustration of this narrow and oppressive spirit. Near the close of the seventeenth century the missionary LeComte published his "*Nouveaux Memoires sur l'etat present de la Chine*," in which he had the candor to say what he thought, namely, that "the Chinese had adored the true God for two thousand years; that among the nations, they were the first who had sacrificed to their Creator and taught a true morality." (See Villers, p. 191.) Such a clamor as resulted from this publication is to us inconceivable. The Sorbonne of Paris condemned the book and the feeble French Parliament ordered the hangman to tear and burn it!

For a time; during the intense excitement of men over religious topics, during the heat of the Reformation struggle, the studies in which the humanists, or lovers of advanced thought, were so much delighted, attracted much less attention than in the period just preceding the breaking out of the trouble between Luther and the pope.

Medieval philosophy was the handmaid of theology, and all knowledge was the abused monopoly of the clergy. Their greatest work for the thousand years preceding the Reformation period was to bridge the chasm between ancient and modern thought, to preserve and transmit thru monasticism the ancient authors, sacred and profane, who now survive.

Yet even before the granaries of literature in Constantinople had been sown broadcast over the world, a little of the seed of thought had been scattered here and there and gave promise of a harvest; and it can hardly be doubted that if Constantinople had not fallen, as it did, the revival of letters and consequent religious reformation would have taken place. But the permanent results of all this intellectual advantage had not been secured but for the reformation in moral and religious conceptions. The "Revival of Learning" would in all probability have terminated in the patronage of princes and in homage to genius and taste. There were real indications of a coming fruitage from the growth, ripening, and seed sowing of such minds as Wiclif, Dante, Petrarch and Boccaccio.

THE REFORMATIONAL IDEA.

Before the Reformation, men's minds were bound. The Reformation was a process of unbinding from the restraints of the hierarchy of the Church and from the superstitions of men's own minds. When men felt free they thought; when they thought they stirred up others to think. Tho the Reformation began ostensibly in an attempt to substitute Bible authority for pope, yet its essential principle was freedom of mind: the right and duty of each man to think for himself. Against the results of this, Catholic writers loudly inveigh. Fletcher, Alzog, McQuaid, Capel, and others ascribe to the principles of the Reformation all the atheism and infidelity of modern Europe and America. Grimke replies to this:

Grant it, and so we may say that without Christianity, the countless heresies of the primitive Church would never have existed; without the liberty of the press, its licentiousness would be unknown;

Nor can they
Be free to keep the path who are not free to stray.

In ancient Egypt the artists were limited, by the laws of religion, in the colors that they might use, and as a result painting never reached excellence, but remained coarse and unrefined. In like manner, before the sixteenth century, there were multitudes of abuses adverse to the improvement of society. The Reformation

did much to remove these and inspire the minds of men with new activity. In the north of Europe it called forth the powers of humanity, while in the south, the Reformation not having taken root, the Renaissance spirit was arrested and the promised glory of Italy and Spain was smothered. In those countries the greater dread of adopting Protestant ideas permitted the government to pass more completely into the hands of the Roman Catholic clergy, and they, being armed with the power, grew more jealous and intolerant. In the times just preceding and during the Reformation, there breathed a spirit of life and progression in Italy and Spain which subserviency and long degeneracy have rendered their people to-day incompetent to repeat, even if it should be tolerated.

Such a spirit of practical and speculative investigation had never before prevailed in the world. Ancient inquiry was generally theoretical, and employed only a very limited part of the community. It had its "Augustan age," extending perhaps from Thales to Seneca; but it perished, leaving little that tended to the substantial improvement of the people. The speculations resulting from the Reformation have taken a wonderfully practical turn. By this have the people received "beauty for ashes, the oil of joy for mourning, the garment of praise for the spirit of heaviness." Thru this the modern world has come "to live and move and have its being."

EFFECT OF THE REFORMATION ON PHILOSOPHY.

This general awakening could not do otherwise than arouse the philosophical spirit and give it new form and being. Probably the man first impressed with the need of an improvement in philosophy was Melancthon, whose name we justly place second in reformational honors. He says, "I desire a sound philosophy, not those empty words to which nothing real corresponds." The reformers broke the chains of authority and thus allowed themselves and others to speculate freely concerning God, his works, and their relations. They reversed the doctrine of Anselm, which was, "Not to understand that I may believe, but to believe that I may understand." They would understand before they believed. They started the tendency to examine the facts and then deduce a theory, as opposed to the old method of being previously committed to a theory and then *reading* its proof from the facts, whether the facts sustained it or not. As some one has tersely said, "If the facts were not in accordance, then so much the worse for the facts." Men

tried to think in the Middle Ages and spent much time in intellectual gymnastics; but that curse of all the ages, the ban of heresy, confined all mental exertion within the limits marked out by the Church. Hence the world is disgraced by the spectacle of all Christendom engaged in the prattle of children for a thousand years.

The legitimate result of this mental emancipation was the development of that highest of philosophical sciences, natural theology, an undreamed-of idea in pre-reformational Christendom. The seed planted by the reformers, having its germ in Melancthon's work on Physics, has produced abundant fruit in the works of later thinkers. Following naturally in the train of this more excellent method of theological conceptions, came a better philosophy of human life. Inquiring into the nature of man, we have more nearly ascertained his needs and how to meet them. With some latitude for the work of the ancients, it may be said that moral philosophy dates from the Reformation. Here, too, Melancthon paved the way in his "Elements of Ethics" in 1550. Forsaking Aristotle, and refuting Epicurus and the Stoics, he defines virtue to be "obedience of the will to such rules of action as are in practical accordance with the command of God."

Until very recently it may be truly said that no branch of science has been cultivated with so much eagerness and success, by German, French and English thinkers, as the application of philosophy to morality. How encouraging the change! How vastly more important to determine, first, what virtue and duty are, before ascertaining the number of angels that can stand upon the point of a needle, whether God could cause himself to die, or whether Christ could have appeared as a squash! If the scholastic philosophers reasoned of rights at all, it was always the rights of the poor, down-trodden, and abused (?) pope and clergy, never those of the people. And so with indomitable perseverance and dialectic quibbling, as silly as persistent, they whiled away the centuries.

The new spirit drew from monastic archives the manuscripts of Aristotle coated with the dust of centuries. Up to this time, the monkish logicians thought their systems were founded upon his. It had never occurred to any of them in two score generations that there might be an advantage in each studying him for himself. Aroused by the new spirit, men took down the books and examined them. This revealed to a deluded world the fact that the revered system of the schoolmen had scarcely any resemblance to that of the "Stag-

irite." By centuries of devotion to the idea of a political Church which was infallible in its own eyes, the Christian world had been gradually lulled into intellectual stupor. At the time of which we are speaking, this had resulted very nearly in spiritual death. The new infusion of a more healthful method of looking at things brought with it a new spiritual life to the many who embraced it. The appetite of reason was afterwards treated with the philosophies of Pythagoras, Plato, Seneca, Marcus Aurelius, and the rest of the Greek and Roman thinkers. This diet and atmosphere proved so healthful that an age of philosophers followed. Thus the race is blessed with the lives of Bacon, DesCartes, Hobbes, Grotius, Spinoza, Gassendi, Pascal, Malebranche, Butler, Locke, Leibnitz, Wolf, Bayle, Berkeley, Hume, Kant, Hegel, etc.

EFFECT OF THE REFORMATION ON EDUCATION.

Previous to the time of the Reformation, men seldom had the courage to look a new truth in the face. Speculative thought was not compatible with the immutable principles of scholastic theology. The credulity of men had reached a climax in the belief in the teachings of priestcraft, and thus from accumulated incapacity thru silly faith, and under mortal fear lest it should tread on holy ground, the mind of man remained almost stationary for ages. Proscription, then as now, was fatal to all free and manly exertion. Ecclesiasticism has always been a dominating power, and when strong enough this spirit makes an abject slave of mind. But with the Reformation begins a new era in the educational history of Europe. In fact it is *the* great era in the history of education. The works of antiquity being unearthed, the problems which moved the ancient mind now moved the modern. Hitherto men had been led by authority, now it beamed upon them that a man's individual judgment determined the responsibility of his faith and practise. It became, therefore, a matter of great moment, that these convictions of individual judgment should be rightly and wisely formed. Hence, if all were to exercise their private judgments, all must be educated to the capacity of an intelligent exercise of them; i. e., if universal exercise of judgment, then universal education. Without this the Reformation was seen to be a gigantic blunder. This was indeed one real difference between the traditional view of the Church and that of Protestantism.

But reformers generally are liable to fail in discerning the effects

of their measures on the minds of those less informed and less imbued with their spirit than they. Almost every person is a would-be reformer (?) to the views which he holds. Yet each forgets to thoroly extend in thought his theory as it would seem in general practise. Perhaps this was well in the case of the early reformers. Foresight of the result of their efforts would probably have been at the expense of courage to undertake. Thus, theoretically, there was opened up the notion of a possible and a necessary universal education. Every effort put forth for this end in modern times finds its beginning here. Luther proclaimed that the education of the people was a crying want of his day, and he wrote letters to the various town authorities urging attention to this necessity. In England the same object was earnestly labored for. Many bequests were made. So in Scotland we have the efforts of John Knox and his coadjutors to establish parochial schools and churches in every parish in the kingdom. In Germany during the last three centuries more than twenty universities have been founded, three-fourths of which are Protestant. Notwithstanding the fact that the Catholic population is double the Protestant in Germany (including Austria), yet there are nineteen Protestant universities and only seventeen Catholic. Such facts show that Protestants realize that the very existence of their "ism" depends on their being the best informed. But how was this unforeseen and prodigious necessity to be brought about—of making every class from royalty to lowest peasantry capable of a judgment of its own? The question is still waiting for a full answer after three hundred years of effort. But an answer there must be; the security, comfort, and development of the race depend upon it.

Education is now believed to be a question of national policy, a necessity to the people, and the business of every individual. For a long time naturally, on account of the revival of antiquity, antiquity was supposed to furnish the answer. But finally, that spirit of inquiry which had overstepped the bounds of authority, had also re-explored (as was supposed) the fields of ancient research. Then it spread into the fields of original investigation. The grammar, logic and rhetoric of Galen, Celsus and Aristotle no longer gave satisfaction. Comenius, Bacon, Stourm, Locke, Milton and others changed the methods of teaching and laid the foundation of a better system of education. Emulating their example, the Fenelons, La Chalotais, Schlaezers, Pestalozzi, Froebel and Spencer have given us our grand modern educational methods and principles. During this time also,

the world has been furnished with new thought on which to use its better educational theories. The world has gotten into the habit of consulting the book of nature as well as the decretals of the Church of Rome and the classics of the Greek and Latin languages. If Grimke's statement made in 1827 was true then, it is twice true now:

More has been done in three centuries by the Protestants, in the profound, comprehensive, exact, rational and liberal development, culture and application of every department of knowledge, both theoretical and practical, with a view to public and private improvement, than has been done by all the rest of the world, both ancient and modern, since the days of Lycurgus.

EFFECT ON THE DEVELOPMENT OF PHYSICAL SCIENCE.

In recalling the intellectual consequences of this great historical movement, we naturally come next to that most wonderful of all developments, modern physical science. From the time of its unshackling, the mind of man seems to have been tending toward a more practical use of its powers. At least the fact appears that the more speculative branches of knowledge have first received attention. It may be that a higher degree of speculative and reasoning power is necessary before man can discern the physical forces of nature and turn them to his advantage. However the case may be, since he has acquired the knack, his successes have been a constant source of surprise, delight, and added comfort to him. As we look about our homes and land, we see them crowded with articles of convenience scarcely any of which, in their present perfection at least, antedate the Reformation. These are but the tangible results of our systematic thought, which we call science.

The science of the ancients ends with theory; the science of our age has only begun when it has theory. The modern mind insists on verification and reduction to practise. This reverence for fact and the prevailing trust in the universality of natural laws have wrought and are working wonders in physical science. It would require nothing less than a library to describe the post-reformational achievements in physics, chemistry, biology, astronomy, history, and in the agricultural, mechanic and fine arts. Since Luther nailed his theses to the church door at Wittenberg how changed has been the life of the world! Societies for the advancement of all that pertains to the material welfare of man have been organized in every part of the globe where the reformational idea could work unmolested. Such gatherings as the Royal Society of England, the French Academy of Sciences, and multitudes more of similar character, would

have been impossible before on account of popish interference, even if other circumstances had made them possible. Again and again has this statement been proved by the attitude of the Church of Rome to the advances which have been made where it has had more or less power of interference. It seems almost as tho it had set its face resolutely against enlightenment and was determined that the people should remain in ignorance. The shout of "infidel, atheist, enemy of God!" has been raised against every man who has dared to publish to the world the results of his most careful investigations. So it was with the earlier conclusions of science, and so it continues to be even now. When Galileo with his newly-invented telescope discovered the moons of Jupiter, he was told by the priests that it was impossible, because there were only seven openings to a man's head! What connection this has with the number of planets in the solar system is hard for the modern mind to perceive. Because he said the world moved, he was summoned to Rome, threatened, tried, condemned, and forbidden under pain of death from further advocacy of the Copernican theory, and compelled to live the remainder of his life in the strictest retirement. Copernicus himself, after twenty-three years of careful study of the heavens and of all previous astronomical systems, waited yet thirteen years longer to avoid "the baleful tooth of calumny," before he proclaimed (1543) that our little world is not the center of the universe. Both the book and the ever-certain condemnation came too late for him to rejoice or suffer on their account. When in a half-unconscious state a few hours before he drew the last breath of his busy life, a copy of his great work was placed in his hands. He never knew how great it was. No work of modern times has so much extended the range of human intellect, or so increased in the minds of men the thought of the majesty of God. That was a great day in the progress of human kind when men realized that the power and wisdom of God were not circumscribed by one little world.

Thus thru such difficulties as these have the grandest achievements been accomplished. The world as a whole is perhaps too much given to condemning the new and clinging to the old. It would be difficult to find any great step of advancement which has not received an inconceivable amount of opposition. The great inventions of recent times have not been exceptions. The application of the powers of steam and electricity for the assistance of human agency are current instances. Dogmatic ecclesiasticism and superstitious

fear have ever formed, and so long as they remain, ever will form, well-nigh irresistible barriers to progress. But since the blindfold of authority was snatched from before the eyes of the Christian world, it has seemed as if there was no limit to the devices which the cunning of intellect has conceived and the ready hand has fashioned. Along with an impartial and genuine increase of knowledge always comes an increase of faith in the ways of Providence, and likewise a belief that the true life of man consists in continued advancement.

EFFECT OF THE REFORMATION ON THE STUDY OF LANGUAGES.

The impulse given to the study of Scripture by the reformers resulted in an assiduous study of the Hebrew and Greek languages. These attainments served as a key to unlock other departments—history, law, antiquity, geography, as well as theology. Before the days of the great reformers, Hebrew and Greek were almost entirely neglected, and even condemned by university authorities and doctors of the Church as a sure path to heresy. The opponents of Reuchlin had never seen a Greek Testament, and Hebrew was supposed to be a cunningly devised language of sorcerers. The Bible being recognized as the only rule of faith, it became necessary for every clergyman to know it in the original and for the laity to possess it in the vernacular. We may gather some idea of the prevailing ignorance of the clergy as to these languages in Reuchlin's time from what Heresbach relates in his "*Orationes de Laudibus Literatis Græcis*." He heard a monk tell his audience:

They [the heretics] have introduced a new language called the Greek: this must be shunned. It occasions nothing but heresies. Here and there these people have a book in that language, called the New Testament. This book is full of stones and adders. Another language is starting up—the Hebrew. Those that learn it are sure to become Jews.

One result of the taste created was an extensive search for manuscripts. This labor was richly rewarded. With every success has come increased zeal for philological inquiry and the consequent intellectual advancement. The impetus given by the Reformation to philological study has ever since formed the basis of university education.

Upon the development of modern languages, it must also be noticed, has the effect of the Reformation been most salutary. Before the sixteenth century a learned Latin jargon was the language of schools and books. No nation can have a literature without a

language of its own. Even should its thinkers write, its people could not read their productions. Some great and universally interesting event, a favorite topic for all, exciting all, was needed to stir the people to talk and the thinkers to write. This want the Reformation met. It was a marshaling of great ideas, and such a cause must have a great field of operation and great forces to support it. Hence, instinctively, the reformers, at the very beginning, made direct appeal to the people. To do this, of course, they must use the language of the people. During the long struggle between papists and reformers in Germany, Switzerland, France, Netherlands, England and Scotland the different languages were elaborated, purified, and embellished in style. The German and English Bibles remain grand literary monuments of this period.

The muses, too, partook of the spirit of the times, and poetry in unprecedented profusion poured forth in the form of dramatic, epic, and lyric works in the languages of the people. In England the "Elizabethan Age" enriched our literature with numerous immortal productions. To it we are indebted for our Spenser, Shakespeare and Milton.

EFFECT OF THE REFORMATION ON THE STUDY OF HISTORY.

The impulse given by the Reformation to the study of history is indeed very noteworthy. So much so that before that great movement we do not expect to find more than the material for history, and oftentimes poor material at that. The pretenses in the shape of annals, chronicles, etc., of the Middle Ages are almost invariably devoid of the scrutinizing criticism of modern historical productions. The superstitions and ignorance of those who kept the records caused them to mistake the untrue for the true, the wrong cause for the real, the supernatural for the natural. Then again in the case of church chroniclers, their enthusiasm for their cause made them blind to the importance of other things, and, in many instances, excessively dogmatic in their treatment of the views of others. To such an extent was this carried for hundreds of years that the writings of men who were supposed to differ from the common views were destroyed, sometimes even their names were suppressed, and history was treated as tho they never existed. Sometimes again when a particular doctrine or practise was seen to lack the historical support which its advocates desired, documents were boldly and audaciously forged, assigned to some high authority in the age of the

supposed origin of the doctrine or practise, and passed on into history as real. By such methods we now account for such writings as the Clementine Homilies, the Apostles' Creed, the Apocryphal and some other books of the New Testament, the document relating to the Donation of Constantine, etc. By such treatment the true understanding of the past has become irreparably confused. Nor are we sure that we have yet eliminated, anywhere nearly, all such errors, let alone the impossibility of recovering the numerous documents that have been fraudulently destroyed or accidentally lost.

But since the times of the Reformation a new historical attitude has begun to grow. Its spirit has given the discernment which is helping us to seize the "clew to the labyrinth of ages." Thru what we term the "philosophy of history" we believe there is now discovered a progressive tendency of humanity; that the race, like each individual, has a childhood and a manhood; and that the knowledge of its childhood and youth is neither satisfactory nor sufficient for the stage of manhood development. The time has nearly passed when men shall think that they have reached a finality in anything pertaining to doctrine or practise. From the scattered facts of human conduct we draw great precepts, lessons, and prophecies. We look forward to ages that will regard our comparatively great advancement with feelings akin to pity.

The linguistic enthusiasm spoken of in the previous section has led to very extensive research in what may be collectively termed "Orientalism." Instead of basing Scriptural interpretations upon "traditions, passages from the holy fathers, decisions of councils, pontifical bulls, decretals, charters, and other historical monuments true or counterfeit," Protestant theologians "were obliged to investigate and attain exact knowledge of the places, manners, events, ideas, whole intellectual culture, and the political and private state of the different nations during the period when this prophet or that evangelist had written." (Villers, p. 195.) Thus with wonderful zeal have the sacred and classic historians and poets been traced thru Egyptian, Arabian, Syriac, Chaldean, Samaritan, Persian, Greek, and Roman antiquities. Incalculable service was rendered in this direction by all the reformers; and, up to the present time, the study of all that helps to the understanding of ancient literature has gone on with increasing interest. In fact, so extensive had been the work done by Protestants, that Villers said (p. 201) at the beginning of this century:

Whoever is anxious to be well informed in history, in classical literature, in philosophy, can use no better method than a course of Protestant theology.

EFFECT OF THE REFORMATION ON ECONOMIC QUESTIONS.

Our previous inquiry has seemed to indicate that the Reformation was the impulse which aroused a very great activity in several fields of thought. A similar activity to that which has been already noticed took place in the realm of economic subjects. An incalculable amount of literature upon questions of this character has been produced. This phase of the movement was late in starting (about 1650), and made little headway for nearly one hundred and fifty years more. In our own century it has come forward with great rapidity. It has become the chief topic of the time, and will doubtless engross a large part of popular interest for many years to come. The result upon nations can best be seen by statistical comparisons of Protestant with Catholic countries. The present and past condition of Italy, Spain, Portugal, and Austria compared with that of England, Scotland, Holland, and Germany tells the story. On the one hand, poverty, indolence, and vice are the most conspicuous features; on the other, some degree of comfort, industry, and virtue greet us on every side. It is ascertained from statistics that the number of criminals in Catholic and Protestant countries is in the ratio of four to one. What contrasts in agriculture, rural economy, and local government meet the traveler in these lands! Where the mind and hand of man are free, there knowledge and activity are common. Says Villers again, in passing thru Germany and Switzerland, and speaking of their state a century ago:

Does the traveler meet with a miserable mud cottage, covered with thatch, the fields badly kept, wretched, rude peasants, and many beggars; he will be in little danger of error if he conjecture that he is in a Catholic country. If on the contrary, neat, pleasant houses are seen, offering the spectacle of affluence and industry, the fields well inclosed, a culture well understood, it is very probable that he is among Protestants, Anabaptists or Mennonites. (P. 214.)

Macaulay, who will not be accused of partisan leaning toward dogmatic Protestantism, corroborates this view. He tells us that under the sway of the Church of Rome—

The loveliest and most fertile provinces of Europe have been sunk in poverty, in political servitude, and in intellectual torpor; while Protestant countries, once proverbial for sterility and barbarism, have been turned by skill and industry into gardens, and can boast of a long list of heroes and statesmen, philosophers and poets. Whoever knowing what Italy and Scotland naturally are, and what four hundred years ago they actually were, shall now compare the country round Rome with that round Edinburg, will be able

to form some judgment as to the tendency of papal domination. . . . The Protestants of the United States have left far behind them the Roman Catholics of Mexico, Peru, and Brazil. The Roman Catholics of Lower Canada remain inert, while the whole continent round them is in a ferment with Protestant activity and enterprise. (Hist. of Eng. I, 45.)

Carlyle, in his inimitable way, writing upon the influence of the Protestant principle, says:

Austria was once full of Protestants, but the hide-bound Flemish-Spanish Kaiser element presiding over it, obstinately for two centuries, kept saying, "No, we, with our dull, obstinate, Cimbургis underlip, and lazy eyes, with our ponderous Austrian depth of habituality and indolence of intellect, we prefer steady darkness to uncertain new light!" and all men may see where Austria now is. (Hist. of Fred. II, I, 202.)

JESUITISM.

A very peculiar intellectual result of the Reformation is to be found in the work done by the Society of Jesus founded by Ignatius Loyola. At almost the same moment of Luther's advance upon the stage of history from the North, Loyola comes from the South. The one from wide-awake, out-spoken Saxony; the other from sleepy, insidious Spain; yet both curiously animated by untiring zeal. One, the open advocate of liberty and reform; the other, the secret instrument of bigoted intolerance. Altho it can hardly be said that the order of Jesuits had its origin in the reformational movement, yet it was turned at once into a counteracting force against the supposed object of the Reformation. It took on much of the educational spirit of the age. The schools under its control helped much to spread the taste for philological and mathematical studies. Europe had tasted of the tree of knowledge. In fact the desire for knowledge was so wide-spread that it was no longer safe to oppose it openly. The next best thing was to get possession of the knowledge and guide it in the interests of the hierarchy. Against the plain facts of the reformers they opposed crafty, dogmatic explanation, and the ignorant were lulled again into security. In this underhanded manner the people were also taught to hate the new views of religion. On the one hand, the Jesuits manifested inconceivable talent in the cultivation and perfection of those branches of knowledge which threatened not the least danger to the hierarchical system. On the other hand, they exhibited an opposition just as decisive against the study of those branches which might throw light upon the misdeeds of the Church, or in any way incite the people to a desire for liberty and a disposition to shake off the despotism of the papal system. The Jesuits hoped by perfection in such

branches as mathematics and languages to obtain the reputation of being the oldest and most learned scholars of Christendom, and thus to clear the Church of the reproach of the reformers. Possessed of this celebrity, they trusted they would be able to direct the study of history, science, philosophy and theology at pleasure.

It is not too much to say that the Jesuits strove eagerly to make difficult, ridiculous, and forgotten all those studies which tended to moral enlightenment. Jesuitism has sent forth from its schools many fine Latin scholars, skilful translators and grammarians, great dialecticians and eminent orators. Besides it has no doubt acted as a wonderful stimulant to make the Protestant ranks labor more vigorously to check the power of Catholicism so greatly augmented by Jesuitism. Nevertheless, it is to be lamented that the Jesuits proved a mighty force in suppressing liberty, and in this way the spread of intelligence. Consequently those countries where they became strong—Italy, Spain, and Portugal—still wander in the darkness of medieval ignorance and superstition. Thru its censorship of the press and its book-police, Jesuitism achieved wonders in suppressing Protestant thought. For example, it is known that hundreds of thousands of copies of the little book called "Of the Benefit of Christ's Death," were circulated in Italy for the purpose of popularizing the Lutheran doctrine of "Justification by Faith," and it has been translated into many languages; but it was so utterly blotted out that when Ranke wrote his "History of the Popes" in 1834, he said no trace of the work existed. Häusser tells us that since then three copies of it have been found and thousands published again.

PROTESTANT SECTS.

The liberty of opinion to which the Reformation gave birth, itself became the parent of numerous denominations of Protestantism. These children, inheriting the spirit of authority and intolerance from grandmother Rome, have proved a very quarrelsome family. Down to the present moment the peace of the Christian world has been repeatedly broken by denominational bickerings. Men seem very slow to learn the lesson of charity, that the same demand which they make from others should in turn be granted by them; in other words, that the truest and purest Christian liberty grants each man the right of forming a sort of denomination in himself if he so chooses.

The first reformers clung to the hope of ecclesiastical unity thru

a settlement of all difficulties by a general council. (This thought has been again revived in the now prevailing movement for "church unity.") Next came the effort to reform the "national churches" by abolishing abuses and reconstituting creed, polity, and ritual. But soon irreconcilable divisions arose. Notwithstanding all, "it is better to dispute on religion than to agree quietly not to have any;" or to differ in opinion than to have no opinion at all.

Surely nothing but uncharitable bigotry would look upon the newly liberated Reason with other expectation than that of seeing frequent mistakes. After so long captivity in the prison-house of scholasticism, the doors are burst, the chains are struck off, and Reason totters forth, pale, emaciated, and unsteady in step. No longer held by the shackles of authority, she is bewildered. The unaccustomed light of knowledge blinds her eyes. Her brain becomes dizzy, and for a time her gait is very erratic. "Better have left her in the ignorant bliss of her prison quarters," tauntingly and lamentingly exclaims the ultramontanist. "A thousand times, NO," shouts the modern advocate of liberty of opinion, "Let Reason be free, she will gain strength by exercise!" And so it has proved. Enough has been accomplished since thought has been free to show the unpardonable wrong inflicted upon humanity for ages by a bigoted and selfish popish hierarchy.

From the liberty claimed and asserted by Luther in the face of the most degrading tyranny the world has ever tolerated, have followed an age of higher philosophy, a new spirit in literature, the scientific method, a real history of the past, a beginning toward universal education and free schools, the first stages of a political and economic sympathy, our national independence, our civil and religious liberty, our unmolested press, our marvelous national enterprise, our glorious past, and our hope of a still more glorious future.

Who could draw even the outline of the past and future changes upon the moral face of the globe caused by the mutual indignation of two Saxon monks? And when will these changes cease? Certainly, not till every tottering throne of temporal and spiritual despotism shall have hopelessly fallen and broken. "Eye hath not seen, nor ear heard, neither have entered into the heart of man the things which are prepared" for the world when Reason and Love shall sit side by side and together reign.

MUNICIPAL LIBERTY. III.

BY FRANK PARSONS.

THE cure for the evils of excessive dependence is a reasonable independence. The remedy for municipal subjection is municipal sovereignty. Home rule for cities and towns in respect to distinctly local concerns is a very much needed reform. A city should be free to manage its local business without interference, and should be free to act outside the distinctive local sphere so long as it does not infringe a positive law of state or nation.

The best method of establishing home rule would be thru constitutional provisions:

1. Drawing a line between state affairs and local interests as clearly as the line between state and federal interests is drawn in the national constitution;
2. Excluding the legislature from the field of local municipal business, so that the city may be sovereign in its own peculiar sphere, just as the state and nation are sovereign in their spheres—free to act in its own concerns, subject only to broad limitations such as those applied to states in the federal constitution;
3. Affording proper safeguards against special legislation, even in matters wherein municipal life merges into state life;
4. Guaranteeing the local selection of local officers; and
5. Securing to every city and town the right to do any act whatever, whether inside the field of local sovereignty or beyond it, so long as it does not conflict with state or national law—reversing the present rule, and instead of the principle that a city can do nothing without permission, establishing the principle that a city can do anything unless forbidden—a difference as great as that between servitude and liberty.

Thus may be secured a reasonable independence for municipalities from improper legislative control. But *civil service reform*, and the *initiative and referendum* upon ordinances and charter provisions, must be established also, else freedom from legislative bossing may mean subjection to councils and local politicians. The substitution of mayor and council or mayor and aldermen for governor and legislature would generally be of some benefit, since mayor and aldermen and councilmen belong in the city they rule, and under-

stand something of its condition, are elected by the citizens of the city, and have interests thru which they can be made to feel the local public sentiment to some extent; while the state legislature is almost wholly composed of men from other cities and towns, who have little or no acquaintance with the city under consideration, do not understand its needs, have no direct interest in it, were not elected by its citizens, and do not feel the slightest responsibility to them. Nevertheless, home rule without the referendum would still be government by the few, and the government of local business by a few who live in, understand, and are elected by the city, is likely as a rule to be superior to government of local business by a few who don't live in nor understand nor owe allegiance to the city, yet government by a few in any form is likely to be far less honest, just, progressive and beneficent than government by the whole body of American citizenship.

Under such home-rule provisions, each city and town might make its own charter, choose its own officers and govern itself, subject only to broad limitations of state and national law. Nothing could do more than such local self-government for the cause of municipal progress and purity. And on that cause hangs the future of the republic. A hundred years ago only one-thirtieth of the population of the United States dwelt in cities. In 1890, one-third of our people were in cities of more than 8000 inhabitants. It will not be long before half the people live in cities, and when we include the towns, it appears that municipal problems already affect directly at least five-sixths of our people, and, indirectly, but nevertheless most vitally, all the rest.

Dr. Shaw, who is probably the highest authority on municipal government on this side of the sea, or perhaps in the world, has expressed himself in these strong words:

Good government and progress in our larger cities will be greatly aided by the extension of their powers of local self-government, or the establishment of municipal home rule, so that the people may feel that they have their own municipal welfare clearly and definitely in their own hands.

And again, discussing the New York Charter—

We shall never reach a permanent basis in this country until we have attained simplicity and unity, so that the people of a large town may feel that they have their own municipal weal or woe clearly and definitely in their own hands. *Then a strong public opinion will arise to protect such municipal home rule, and, with or without constitutional safeguards, we shall find that municipal government will go on steadily.*

On the way toward the solid independence outlined above, a number of partial reforms may be of advantage. When it is not possible to get a whole loaf, half a loaf is better than none.

A. Constitutional provisions may be adopted covering part of the ground. This has been done to a considerable extent already.

B. The Michigan Doctrine may be followed by the courts of other states. Efforts to secure such rulings even if unsuccessful cannot fail to do good by directing attention to the fundamental importance of local self-government and the weighty opinions of Judge Cooley and others.

C. Broad statutes may be passed giving cities larger powers, especially in regard to the granting of franchises, and the right to own and operate local business enterprises. A considerable movement has taken place in this direction in the last few years, but it often requires a hard fight to pass such bills; and they are apt to be narrowed in scope, gorged with wind and red tape, and assassinated with ingenious amendments and limitations. Moreover they are subject to legislative alteration or repeal. In spite of all their imperfections, however, they are very important aids while on the way to solid constitutional measures, and the growth of public sentiment around them gives them, in the course of time, a practical stability much greater than that which they possess theoretically.

The principle of local consent is recognized in 15 constitutions. Massachusetts, Pennsylvania, South Carolina, and Wyoming require local consent as a prerequisite to the incorporation of a city. New York, West Virginia, Illinois, Missouri, Nebraska, South Dakota, South Carolina, Georgia, Alabama, Kentucky, Idaho, Colorado and Wyoming require local consent for the construction of a street railway. In some states the provisions are broader, Kentucky does not permit the construction of any street-railway, gas, water, steam-heating, telephone or electric-light system in city or town without its assent. South Carolina requires local consent for street railways, telegraph, telephone, electric light, water and gas. Wyoming requires such consent for the first four just named, and South Dakota for the first three.

By South Carolina's constitution (1895) cities and towns are empowered to build or buy water-works or light plants and supply the inhabitants on a majority vote of the people.

In Massachusetts, New York, Pennsylvania, Minnesota, Wisconsin, Iowa, Indiana, Michigan, Kentucky, Kansas and other states,

laws have been passed giving municipalities the power to grant street franchises, and to build or buy municipal public utilities such as water-works, gasworks, electric plants, etc.

Five states have given municipalities the right to make their own charters: Missouri in 1875; California, 1879; Washington, 1890; Minnesota, 1896; and Louisiana in 1896—the first four by constitutional provisions, Louisiana by statute. In Missouri the provision applies to cities over 100,000 population; in Washington to cities over 20,000; in California to cities over 3,500; and in Minnesota to all municipalities. The Louisiana statute adopts a rule precisely opposite to the Missouri principle, and permits all municipalities except New Orleans to make their own charters.

In Missouri the city elects 13 freeholders who prepare a charter which is submitted to the people, and if ratified by four-fifths of the qualified electors voting, it becomes the charter of the city. St. Louis was given special authority to adopt a charter by a majority vote. Amendments may be submitted by the legislative authorities of the city and adopted by a two-thirds referendum vote.

In Minnesota the charter is prepared by a board of 15 freeholders appointed by the district judge, and must be adopted by a four-sevenths vote of the people. Amendments by a three-fifths vote. By a statute of 1897 freeholders are to be appointed whenever 8 per cent of the voters of the city or town petition to that effect, and the legislature of 1897 proposed a new amendment to the constitution providing that charter amendments should be submitted to the people on a 5-per-cent petition of the voters.

In Washington the legislative authority of the city may order the election of 15 freeholders to prepare a charter to be adopted by majority vote of the people. Amendments are proposed by councils and adopted by majority referendum vote. By statute the city council must order an election of freeholders upon a petition of one-fourth of the voters of the city.

In California 15 freeholders are elected to make the charter, which must be adopted by a majority vote at the polls and approved by the legislature. Amendments at intervals of not less than two years, submitted by the legislative authority of the city, are ratified by a two-thirds vote at the polls, and approved by the legislature.

In Louisiana, on petition of a majority of the property owners of any city or town (except New Orleans) praying a referendum on a new charter, a copy of which must accompany the petition, the mayor

and council shall submit the proposed charter to a referendum vote, and if adopted, it is to be the organic law of the municipality.

In all the states named the home-made charters are subject to the laws and constitution of the state. Under these provisions St. Louis, Kansas City, San Francisco, Sacramento, Oakland, Los Angeles, Stockton, San Diego, Seattle, Tacoma, etc., have established charters of their own making.

The St. Louis charter gives the city power to grant franchises, construct street railways, buy and hold property, real and personal, to be used for the erection of water-works or gas-works to supply the city with water or light, for the establishment of hospitals, poor-houses, etc., *or for any other purpose*; secures the local election or appointment of the city officers required by the charter; and provides that amendments to the charter shall be submitted to the people separately. The people have no *initiative*, however, as to amendments, and neither initiative nor referendum as to ordinances.

In the Los Angeles charter the 23d corporate power is as follows:

To exercise all municipal powers necessary to the complete and efficient management and control of the municipal property, and for the efficient administration of the municipal government, whether such powers be expressly enumerated or not, except such powers as are forbidden or are controlled by general law.

That is mildly suggestive of the reversal of the present legal theory spoken of at the beginning of the section about remedies, but the explicit separation of municipal and state affairs, and the *exclusion* of the legislature from the distinctively municipal field are still missing.

The most progressive charter of all, in some respects, is the one adopted by the voters of San Francisco, in May, 1898. It contains strong civil service rules, declares for public ownership and operation of street railways, water, gas, electric-light plants, telephone systems, etc., announces the policy of gradual absorption of all such monopolies, provides for a popular initiative and referendum upon these questions, and upon ordinances of all sorts, and upon amendments to the charter—a petition signed by a number of voters equal to 15 per cent of the votes cast at the last preceding election being sufficient for any initiative or referendum. The charter is not equally good in all its parts, but these admirable provisions make it possible for the people to mold the charter easily to any form they desire. The people of San Francisco appear to have their own destiny more completely in their own hands than the people of any other

large city in the country. Their control is subject only to general laws, and the approval of the legislature to charter amendments which, it is said, is not likely to be withheld in the case of any reasonable amendment.

CONCLUSIONS.

In going over the laws and constitutions of our 45 states, from early times to the present year, a few conclusions of special breadth and moment have forced themselves upon my attention.

1. There is a powerful trend toward careful definition, regulation and limitation of legislative power.

2. There has been in recent years a tremendous and ever-accelerating movement toward legislation favorable to public ownership and operation of local utilities, particularly those that involve a special or privileged use of the streets.

3. There has been an equally emphatic movement toward a fuller recognition of the principles of local consent, and the right of the the people to be consulted about important measures and vote directly upon them, and the correlative right to initiate legislation if they so desire.

4. The local right to grant local franchises, elect local officers, and manage local property, and the right of municipalities to frame their own charters have also received recognition.

Such are some of the principal streams that make up the current of enactment that is moving toward municipal liberty and independence in respect to local affairs. And yet it must be admitted that no real home rule has been established beyond the reach of legislative interference. Legislatures still have power to alter or abolish charters, and may practically annul even freehold charters, for they are expressly subject, by constitutional proviso, to the general laws of the state. We have as yet no setting apart of a local field from which state legislation shall be excluded, as national legislation is excluded from state interests. Some of our states have made a splendid beginning, but the end is not yet.

THE REGENTS' INVESTIGATION.

BY FRANK PARSONS.

IT being assumed that the readers of THE INDUSTRIALIST would naturally expect to know something of the regents' investigation, the duty was assigned me, some time ago, to keep track of the matter and write an account of it, as clear and fair as possible, bringing together the essential elements of the charges, evidence, findings, etc., to give a birdseye view of the whole affair. I am aware that the undertaking is a delicate one, and I have endeavored to make my condensations and selections in such a way that the persons making the charges, findings, etc., would recognize my abridgment as a fair representation of the substance of their statements. One part of the duty mentioned above I have not been able to comply with, since the evidence in the case, with some small exceptions, is not yet available for precise quotation, the testimony being still entombed in shorthand.

FIRST CHARGE.

(a) Dining kitchen operated by the funds of the College in violation of law.

Majority Finding.—There was no warrant or authority of law authorizing the operation and maintenance of said dining hall or of the bookstore. . . . We are unable to state whether or not said dining hall was operated at a loss to the funds of the institution.

Minority Report.—The evidence shows that the dining hall was self-sustaining, and has in no way been a detriment to the state, but has been a benefit to the students. Charge not sustained.

The minority report says nothing directly about the legality of the dining hall, but apparently proceeds to its conclusion of "charge not sustained" upon the ground that when an act of regents, which is neither expressly authorized nor expressly forbidden by law, proves beneficial to students and not detrimental to the state, it cannot be said to be in violation of law.

(b) Fifteen dollars a month unlawfully and wrongfully paid out of the college treasury, to Regent Limbocker for services as purchasing agent for the dining hall.

Majority Finding.—The board of which he was a member employed said Limbocker as purchasing agent for said dining hall at a salary of \$15 a month.

Minority Report.—The salary paid to said Limbocker was earned and wholly paid out of the revenues produced by the dining hall. Charge not sustained.

Webb's statutes (vol. 1, p. 584, §7) provide:

No one connected with the College as professor, tutor, teacher, or *employee*, shall be a regent.

And again (vol. 2, p. 369, §400):

All officers holding and exercising any office of trust or profit under and by virtue of any law of the state, are hereby prohibited from taking any contract, or performing or doing . . . for their own profit, any work in and about the office holden by them, or in or about any work over which they have in whole or in part the supervision, direction or control.

It was argued by the defense that these provisions excluded the employment of a regent as treasurer or as loan commissioner as much as an employment for service as purchasing agent; that it is nevertheless an established custom to employ one of the regents as treasurer and another as loan commissioner at reasonable compensation; and that all such employments, tho a breach of the letter of the law, are free from any conflict with its spirit and purpose, which is to prevent the use of official power for speculative ends or unfair private profit.

Blackstone says that the reason of the law *is* the law, but it is sometimes a difficult thing to tell just where the reason and the letter of the law join hands.

(c) Regent Limbocker furnished to said College supplies at and above the regular market price of such supplies, (at the trial it appeared that the word "supplies" in the charge meant *firewood*.)

Majority Finding.—Charge not sustained by the evidence.

Minority Report.—The evidence shows that Limbocker sold no wood to the College; but, instead, he permitted *green* wood previously purchased for the College to be exchanged for *dry* wood taken from his own wood-pile, which dry wood was delivered at the College at no extra cost to the institution and at no profit to the said Limbocker.

(d) Regent Hoffman furnished said College supplies from his mill at and above the market value thereof.

Majority Finding.—Regent Hoffman, at the solicitation of members of the faculty at said College, did furnish flour and bran to said College, but in so far as he is charged with furnishing these articles at a price above the market price we find that the charge is not sustained by the evidence.

Minority Report.—The evidence shows that without the knowledge of Regent Hoffman the College bought a shipment of bran from the firm of C. Hoffman & Son, saving \$25 to \$30 thereby. The evidence also shows that the superintendent of the dining hall urged Regent Hoffman to furnish the dining hall with whole wheat flour, since it could not be obtained elsewhere at the time, and that said Hoffman ordered the firm of C. Hoffman & Son to furnish said flour at the lowest wholesale price.

Webb's statutes (vol. 2, p. 369, §400, above cited) prohibit all the aforesaid officers—

From furnishing any materials used in any such work [see preceding quotation] and from furnishing for the use of any institution . . . or other interest, the protection of which interest is a part of the duties of his office, any firewood, clothing, materials for building, or other thing required by such institution . . . or other interest.

SECOND CHARGE.

Business of vital importance transacted by the regents secretly and unlawfully without a quorum, with a full intent and purpose of thwarting the will of the majority of the members of said board; meetings held at the hotel in Manhattan and afterwards entered on the records at the College; and the records purported to show that that a quorum was present.

Majority Finding.—The meetings alleged to have been held on the 2d, 3d, 5th and 6th days of July, 1897, were held without any quorum being present at any of said meetings, and teachers were hired, salaries were fixed, appropriations of money were made, and a vast amount of other business was transacted during said time. The minutes of said meeting held on the 2d day of July, 1897, recite that the "Board met," when in fact and in truth only three members of the board met; but the minutes of July 3, 5 and 6, show that no quorum was present and no business transacted except to adjourn. We further find that at the September, 1897, meeting of the said Board of Regents a resolution was passed approving the minutes of the said meeting as held on June 30 and ending July 6, inclusive;

and alleging that each and every part thereof was adopted and made a part of the regular action of the board at said meeting, and thereby declaring the same to be fully ratified and confirmed as done at said July meeting. We further find that the allegation charging that preliminary meetings were held at the hotel in Manhattan and afterwards transferred and entered upon the records of the College is not sustained by the evidence.

Minority Report.—The evidence shows that the Board of Regents met with a quorum present on the afternoon of June 30, 1897, and continued in session as a quorum until the evening of July 1, at which time the board regularly adjourned to meet at 8 o'clock on the morning of July 2, 1897; that during the night following July 1, 1897, Regents Daughters and Noe, for the apparent purpose of breaking the quorum, left Manhattan and failed to appear at the regular appointed time for the meeting on the morning of July 2, 1897; that at that time it was necessary to engage professors for the ensuing college year; to prepare for immediate publication of the college annual catalog, and otherwise to prepare for the opening of the college year; that the regents remaining, namely, C. B. Hoffman, J. N. Limbucker and T. J. Hudson met at the appointed time and usual place of holding regents' meetings and that they proceeded to transact such business as in their judgment ought to be done, and this after consultation with the retiring president, Dr. Fairchild, intending to have their action ratified at a subsequent meeting of the regents; that the business then transacted by the three regents above named had been at the commencement early in June of said year discussed and agreed upon by the above-named regents and Regent Harrison Kelley and Regent Mrs. St. John, except as to the person to be employed as professor of mathematics, upon which there was some disagreement; and that upon request of Regent Kelley, action on the mathematical appointment had been deferred until the meeting to be held the 30th of June, 1897, causing the entire report of the committee on employees to go over; and it further appeared in the testimony that on July 2, Regent Kelley was on his death bed and could not be present; that thereafter, namely, on September 1, 1897, the Board of Regents met in regular session with a quorum present and that the minutes and proceedings of July 2, 1897, were fully ratified and adopted.

THIRD CHARGE.

(a) Perversion of the College to the teaching of socialism and

political doctrines; use of college funds to print and disseminate socialistic and political doctrines and theories; changing *INDUSTRIALIST* into a monthly wherein were taught socialistic views and political doctrines and political heresies; use of College with connivance of Hoffman and Limbocker for the purpose of distributing populist pamphlets to the students.

Majority Finding.—Allegations not sustained by the evidence.

Minority Report.—Ditto.

(b) That said Limbocker and Hoffman sent out, in 1897, a statement of reasons for the reorganization, which statement purported to have been done by authority of the Board of Regents, and purported to be signed by every member of the board, then in office, whereas in truth said statement was prepared by said Limbocker and Hoffman, with others, less than a quorum of the said board, and was printed and circulated with the signatures of C. R. Noe, C. B. Daughters and Susan St. John without their knowledge or consent and did not express their views.

Majority Finding.—Said manifesto purported to be the act of all the Board of Regents, when in fact the only regents present and giving sanction to it were Regents Hoffman, Hudson and Limbocker.

Minority Report.—Evidence does not show that the statement purported to be signed by anybody. . . . The statement was published by authority of a majority of the regents. (It appeared that a copy of the statement had been sent to Regent Kelley and a letter had been received from him endorsing the said statement and its publication before it was published.)

A copy of the statement was introduced in evidence. There were *no signatures* to it, but the names of the regents, and those of the secretary and assistant secretary, preceded the statement—the list being the same as that then ordinarily used at the head of the first column in each issue of *THE INDUSTRIALIST*. The first appearance of said statement was in *THE INDUSTRIALIST*. The statement in evidence did not claim to be unanimous, but said “The Board of Regents. . . . submit the following statement of reasons,” etc.

FOURTH CHARGE.

(a) The eleventh biennial report shows an expenditure by the

board of \$739.32 above the amount received by it during the year, such overexpenditure being in violation of law.

Majority Finding.—Charge sustained.

A copy of the biennial report was put in evidence, showing on page 18 a deficit of \$739.32 as the college accounts stood June 30, 1898; but in a note below the table, on the same page, the report says:

State warrant No. 161, amount \$1850, was issued by the state treasurer on July 6, 1898: of this amount \$810 was for interest accrued and paid prior to June 30, 1898, and should have been credited to income fund for fiscal year 1897-8.

No evidence was introduced to contradict this note, yet the important statement it contains is not mentioned in either the majority or minority report; at least there is no mention of it in the printed copies of those reports in my possession.

(b) Said board reported an expenditure of \$40,736.67 for teachers' wages for the fiscal year ending June 30, 1898, whereas in fact there was paid to said professors a large sum in excess of that reported, and said report was made with the intent and purpose of deceiving the governor of the state of Kansas and the people at large.

Majority Finding.—In the matter of the payment of teachers, we find that on pages 3 and 4 of the eleventh biennial report of said Board of Regents, in next to the last column thereof, the total amount paid is fixed at \$40,736.67, when in fact and in truth, owing to a change in the date of the school years from September 1 to June 30, in order to make the school years correspond with the fiscal years, a much larger sum of money was paid than that purported. We further find, that in some instances, owing to the discharge of certain teachers and the employment of others, the salaries for July and August, 1897, were doubled and salaries were paid in such cases to two persons occupying the same position for the same time.

Minority Report.—The evidence shows that the gross receipts and expenditures were correctly stated in the report and that the particular matter complained of grew out of a change in the college year to make it conform to the fiscal year, which ended June 30, while the college year had ended August 31.

The result was that the *College* year to which the "Salary Table" (p. 3 of the biennial report) has reference was only a 10-month year,

from Sept. 1, '97, to June 30, '98—the amounts paid professors for July and August, '97, belong to the *school* year of 1896-7, but are included in the total expenditures for the *fiscal* year 1897-8 shown on p. 18 of the report.

It seems that the "Salary Table" (p. 3) would have been rendered much clearer by a statement in immediate connection with it that the change in the ending of the college year had reduced the school year for 1897-8 to 10 months, and that the salaries named in the table related to that 10-month year. It would then have been clear that no one really received double pay—the pay of any professor, X, for July and August, '97, being part of his salary for the year Sept. 1, '96, to Aug. 31, '97; the next year running only from Sept. 1, '97, to June 30, '98, X received his whole school-year's pay in that time; otherwise, a professor leaving or being dismissed at the end of the new year (June 30) might have lost two-twelfths of the pay for his year's work, which in many cases was chiefly or wholly done between Sept. 1 and June 30.

FIFTH CHARGE.

The sum of \$200 appropriated in 1897-8 for an agricultural museum was misappropriated and used for other purposes; no agricultural museum was ever constructed at any time.

Majority Finding.—That the sum of \$200 was appropriated by the legislature of 1897, for an agricultural museum, and that the sum of about \$125 of said appropriation was expended for the benefit of the agricultural museum; that plans had been drawn for the expenditure of the remainder of said appropriation; that a short time before said balance should lapse to the state, a voucher was made out, duly certified and approved by the treasurer of the Board of Regents, C. B. Hoffman, and said balance of about \$75 was drawn from the state treasury and the same placed to the credit of the general funds of the College. The work for which the said \$75 was drawn was not completed nor commenced at the time the same was drawn and has not been completed or finished since that time.

Minority Report.—The evidence disclosed that the Agricultural department of the College has a farm museum and that about \$128.00 was actually used in building up such museum; that the remainder of the fund amounting to some \$72.00 had been actually contracted by the professor of agriculture to be expended for cases to be made by the Mechanical department of the College for the agricultural

museum, but that, owing to the resignation of the professor of mechanics and engineering, said cases were not completed by June 30 and that in accordance with the established custom of the College and to prevent the lapsing of said appropriation said fund was drawn by the proper department heads.

It was in evidence that the voucher to save lapsing of the \$72 was drawn after consultation with the secretary, who had had 18 years experience in the institution, and who said that it was the established custom to proceed in that manner to save a lapse in case of work contracted for but not completed at the close of the year. The money was drawn by filling in the blanks of a form, the printed part of which contained the words "due and unpaid." It appeared that the \$72 is ready to be paid over to the Mechanical department on completion of the cases.

SIXTH CHARGE.

Paying I. D. Graham, secretary and instructor, \$1400 a year instead of \$1200 allowed by law for secretary and instructor; and paying Wm. C. Lee \$800 a year as stenographer in executive office, instead of \$420 allowed by law for such stenographer, with the intent of evading the law, then and there knowing the same to be contrary to law.

Majority Finding.—Said Graham was paid \$1400 for 1897-8 instead of \$1200 as provided for secretary and instructor by the session laws of 1897. His title was changed to read "Secretary and professor of bookkeeping, commercial law and accounts," instead of "Secretary and instructor," but his duties and labors were not greater than those previously performed in said position.

The said Lee was paid \$800, instead of \$420 as provided by law, for the stenographer in the executive office. His title was changed to "private secretary to the president," but his labors and duties were not changed and he only performed the duties and services of stenographer.

Minority Report.—The duties and especially the responsibilities of said Graham were increased, and the said Lee was employed not only as stenographer in the executive office but as private secretary to the president and instructor in the College, and his duties and responsibilities were enlarged beyond those of an ordinary stenographer.

SEVENTH CHARGE.

Employing incompetent president who delegated various executive duties to committees of the faculty, thru the dissensions and incompetency of which the work of said College became disorganized and inefficiently performed, to the great injury of the College and of the students, and said Hoffman and Limbocker well knew at all times the inefficiency and incompetency of the president.

Majority Finding.—Not investigated and no evidence offered.

Minority Report.—Agree with majority, that this charge was not investigated and no evidence offered, and believe it was not worthy of consideration.

EIGHTH CHARGE.

Said Hoffman as treasurer unlawfully and wrongfully delayed payment of claims from 10 to 30 days. While the treasury was supplied with sufficient funds for the payment of all claims properly made out against said College, the said Hoffman corruptly, wilfully and intentionally failed and neglected to pay the claims against the College at the time they were presented to him for payment.

Majority Finding.—Charge not sustained by evidence.

Minority Report.—Ditto.

ADDITIONAL FINDINGS.

The committee found upon two other matters which were not mentioned in the charges.

Ninth Finding.—Board records kept by the president on loose sheets so marked, marred, interlined and erased as to be of questionable value. Minutes not transferred to permanent record book till after the investigation began. Said keeping of the records was with full knowledge of the board.

Minority Report.—Evidence shows minutes were taken down in abbreviated longhand and afterwards copied on sheets in typewriting, in which form they were amended and adopted by the board, which wholly accounts for their marked and interlined condition. It appeared that the delay in copying into the permanent record book was caused by the consideration of a plan for doing the work by typewriter, which proved difficult but was finally pushed thru just prior to the beginning of the investigation (after it had been ordered) so that the investigating committee might have ready reference to said minutes (more ready reference than was afforded by the loose sheets or the abbreviated minutes, all of which were submitted upon request and were compared with the permanent record).

Tenth Finding.—On or about January 7, 1899, the board authorized and directed the president to enter into written contracts with a large number of the faculty for two years ending June 30, 1901.

Minority Report.—Said contract provision was adopted by regents whose terms ran till 1901, and who constituted a majority of the board, their action being intended to secure the College against loss of service.

The charges were preferred by H. A. Perkins. The majority report was signed by G. H. Lamb, Z. L. Wise, Thos. J. Flannelly, and R. B. Ward, the republican members of the investigating committee. The minority report was signed by T. C. Rodgers, the populist member.

With the ten findings the committee transmitted to the governor the stenographer's notes of the testimony and the records in the case, and the majority recommended the dismissal of said Hoffman and Limbocker. The governor thereupon issued an order for the removal of Hoffman and Limbocker, and appointed other regents in their place. Hoffman and Limbocker then filed petitions in the district court for injunctions restraining all concerned from recognizing the new appointees or refusing to recognize them, the said Hoffman and Limbocker.

The petitioners' case was put on the ground that the law of 1889, under which the investigation took place, had not been followed—committee had allowed charges to be amended; had failed to make specific findings as to the truth of the charges as made except where it negatived them; majority findings had shown only technical and trivial errors such as might occur in any well-regulated institution, and did not disclose any serious fault within the meaning of the law of '89, which limits investigation and removal to cases of "corruption, venality, inefficiency, misconduct, immorality, or inattention to duties;" testimony not transmitted to governor except in stenographic notes which he could not read to see if the findings were correct; etc.

The judge ruled that Hoffman and Limbocker had been suspended and removed; and, whether the suspension and removal were right or wrong, they were no longer *de facto* officers and could not therefore claim the protection of an *injunction*, but must enforce whatever rights they might have thru *quo warranto* proceedings.

Whether or not the case will be carried further is not yet known.

The new board is now in control of the College but their policy has not yet been announced.

BOARD OF INSTRUCTION.

Faculty.

- THOMAS ELMER WILL, A. M. (Harvard), President Corner Fifth and Pierre streets
Professor of Economics and Philosophy.
WM. H. PHIPPS, B. S. (K. S. A. C.), Secretary Juliette avenue, north of Leavenworth street
Professor of Bookkeeping, Commercial Law and Accounts.
HENRY M. COTTRELL, M. S. (Kansas State Agricultural College) College Campus
Professor of Agriculture, Superintendent of Farm.
ALBERT S. HITCHCOCK, M. S. (Iowa Agricultural College). College Hill, 2 miles N. W. of College
Professor of Botany
JULIUS T. WILLARD, M. S. (Kansas State Agricultural College) 1211 Moro street
Professor of Applied Chemistry.
GEORGE F. WEIDA, Ph. D. (Johns Hopkins) Corner Manhattan avenue and Moro street
Professor of Pure Chemistry.
EDWARD W. BEMIS, Ph. D. (Johns Hopkins) Corner Juliette avenue and Houston street
Professor of Economic Science.
DUREN J. H. WARD, Ph. D. (Leipsic) 830 Houston street, corner Eighth
Professor of English Language and Literature.
ARNOLD EMCH, Ph. D. (University of Kansas) Corner Fourth and Moro streets
Professor of Graphic Mathematics.
FRANK PARSONS, B. C. E. (Cornell University) Corner Fifth and Pierre streets
Professor of History and Political Science.

-
Professor of Horticulture and Entomology, Superintendent of Orchards and Gardens.
MISS MINNIE A. STONER, (Boston N. S. of H. A.), B. S. (S. D. A. C.) M. E. Parsonage, Poyntz ave
Professor of Household Economics, Dean of Domestic Science Department.
JOHN D. WALTERS, M. S. (Kansas State Agricultural College) North end of Sixth street
Professor of Industrial Art and Designing.
MISS MARY F. WINSTON, Ph. D. (Göttingen) 1211 Moro street
Professor of Mathematics.
JOSEPH D. HARPER, M. S. (Rose Polytechnic Institute) ... Houston st., between Fifth and Juliette
Professor of Mechanics and Engineering, Superintendent of Workshops.

-
Professor of Military Science and Tactics.
ALEXANDER B. BROWN, (Boston Music School), A. M. (Olivet) Corner Juliette avenue and
Professor of Music. [Houston street
FREDRIC AUGUSTUS METCALF, O. M. (Emerson College of Oratory) Corner Poyntz avenue
Professor of Oratory. [and Sixth street
ERNEST R. NICHOLS, D. B. (Iowa Normal), B. S., A. M. (University of Iowa) ... 512 Houston street
Professor of Physics.
CHARLES S. DAVIS, (Kansas State Normal School) ¼ mile west of College
Superintendent of Printing.
PAUL FISCHER, B. Agr., M. V. D. (Ohio State University) ... Juliette avenue and Humboldt street
Professor of Veterinary Science and Biology.
MISS HARRIET HOWELL, (Pratt Institute) Superintendent of Sewing ... Moro street, near Tenth
MISS ALICE RUPP, (Indiana State Normal), Instructor in English ... Poyntz avenue, cor. Seventh
MISS JOSEPHINE C. HARPER, Instructor in Mathematics Corner Sixth and Pierre streets
MISS HELEN J. WESCOTT, Librarian Juliette avenue near Leavenworth street

Assistants and Foremen.

- William L. House, Foreman of Carpenter Shop Corner Sixth and Colorado
R. W. Clothier, B. S. (K. S. A. C.), Assistant in Chemistry Cor. Fremont and Sixth streets
Royal S. Kellogg, B. S. (K. S. A. C.), General Assistant Cor. Sixth and Fremont streets
J. M. Westgate, B. S. (K. S. A. C.), General Assistant Cor. Fourth and Leavenworth streets
Wm. H. Moore, M. S. (K. S. A. C.), Foreman of Greenhouses, Manhattan ave. near Laramie street
C. P. Hartley, B. S. (K. S. A. C.), Assistant in Horticulture Seventh and Bertrand streets
Mrs. Mary L. Hanson, Assistant in Department of Household Economics ... Domestic Sci. Building
Charlotte J. Short, M. S. (K. S. A. C.), Ass't in Household Economics, Leavenworth near Juliette
Enos Harrold, Foreman of Iron Shop Manhattan avenue, south of Moro street
Margaret J. Minis, Assistant Librarian Fourth and Moro streets
R. B. Mitchell, Cadet Major and Acting Com. of College Battalion. Osage st., near Juliette ave.
Lorena M. Helder, M. T. (Kan. Con. of Music), B. S. (K. S. A. C.), Ass't in Music College Hill
R. H. Brown, M. T. (Kan. Con. of Music), B. S. (K. S. A. C.), Ass't in Music 202 Juliette ave
Mrs. Winnifrede W. Metcalf, Assistant in Oratory Corner Poyntz avenue and Sixth street
S. N. Chaffee, B. S. (K. S. A. C.), Principal of Preparatory Dept. ... Moro street, bet. 8th and 9th
Olive Long, B. S. (K. S. A. C.), Clerk of Postoffice Near northwest corner of College
J. D. Rickman (I. T. U.), Foreman of Printing Office Cor. Tenth and Kearney streets
C. Jeanette Perry, B. S. (K. S. A. C.), Assistant in Printing Office ... Corner Colorado and Fifth
Ora G. Yenawine, B. S. (K. S. A. C.), Assistant in Sewing Corner Humboldt and Sixth street
Chas. W. Pape, M. S. (K. S. A. C.), Ass't in Vet. Science and Biology 1104 Moro street

Assistants in Experiment Station.

- D. H. Otis, M. S. (Kansas State Agricultural College), Dairying 814 Houston street
J. G. Haney, Feeding and Field Work Corner Manhattan avenue and Kearney street
G. L. Clothier, B. S. (Kansas State Agricultural College), Botany Fourth and Leavenworth
P. J. Parrott, A. B. (Kansas State University), Entomology Juliette ave. and Fremont street
W. L. Hall, B. S. (K. S. A. C.), Horticulture Manhattan avenue and Fremont street

OTHER OFFICERS.

- Wm. Canfield Lee, A. B. (Kenyon), Private Sec. to Pres. College Hill, 1 mile west of College
Lorena E. Clemons, B. S. (K. S. A. C.), Assistant Secretary Corner Fourth and Laramie
Eugene Emrick, Janitor Leavenworth street, near Eighth
Jacob Lund, M. S. (K. S. A. C.), Engineer South gate of College

THE INDUSTRIALIST.

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KANSAS STATE AGRICULTURAL COLLEGE.

Manhattan, Kansas.



PRES. THOS. E. WILL, Managing Editor.

PROF. JOHN D. WALTERS, Local Editor.

BOARD OF REGENTS.

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HON. CARL VROOMAN.....Parsons

PRES. THOS. E. WILL, Secretary, *ex-officio*.

ABSTRACT OF BOARD PROCEEDINGS, MAY 11-13, 1899.

THE board met with all members present, the *personnel* of the board being as follows: Regents St. John, Satterthwaite, Hunter, Vrooman, McDowell, Yoe and Fairchild. All meetings were held in the secretary's office in the College, except the meeting for the evening of May 12, which was held at the Hotel Higinbotham.

The minutes of the meeting for February 8, 1899, were read; and at a subsequent session Regent Vrooman moved that the minutes be adopted. Roll-call on the motion showed the following vote: Aye—St. John, Vrooman. No—Fairchild, Yoe, Hunter. Not voting—Satterthwaite, McDowell. The following explanation of the "no" votes was ordered recorded: Those voting no, not having been present at the meeting in question, could not approve the said minutes, tho not disapproving. Minutes of the meeting for March 29-30 were read and approved.

Regent Fairchild was elected president of the board; Regent McDowell, vice-president; Regent Yoe, treasurer; Regent Hunter, loan commissioner. Regent St. John suggested that the treasurer be selected from outside the board, it being a matter of question whether under existing law a regent might be treasurer or loan commissioner, such offices being remunerative. Regents Yoe and McDowell were appointed a committee to audit the accounts of the outgoing college treasurer.

Professor Cottrell urged the prompt erection of the agricultural building, and explained plans for modifying the interior arrangements of the agricultural barn. The site formerly occupied by the president's house was selected as a site for the new agricultural building. The committee on buildings and grounds was empowered to attend to the preliminary work of the agricultural and mechanical buildings, but to accept no plans or contracts, said committee to report later to the full board.

The following committees were appointed: Auditing—Satterthwaite, McDowell; Buildings—McDowell, Hunter, Yoe; Agriculture and Horticulture—Yoe, Satterthwaite, McDowell; Faculty—Fairchild, Hunter, Vrooman; Assistants and Employees—Hunter, Satterthwaite, Yoe; Domestic Science—St. John, Fairchild, Vrooman; Course of Study—Fairchild, Vrooman, Hunter; Mechanics—Vrooman, McDowell.

Members of the faculty discussed with the board questions pertaining to long and short courses of study, entrance requirements, preparatory department, etc.

Petition relating to the reopening of the college dining hall, signed by 264 students and others, was read as follows:

WHEREAS, the complication of affairs in connection with the Board of Regents has resulted in the suspension of the college dining hall, with the following results:

1. The town boarding houses that are simply in the business of boarding students for the money there is in it are enabled to charge the whole body of students a higher rate, as they do not have to compete with the said college dining hall.
2. Many of the regular boarders have been compelled to seek board at unreasonable distances and rates. This is especially hard on those who are working their way, as even the loss of time consumed in walking the increased distance is quite an item.
3. Some of the waiters who depend on their earnings in this department are being compelled to leave College.
4. Quite a number of the students are "baching"—living in piecemeal fashion. Its effect on the student's constitution need not be commented upon.
5. The 250 persons who were dependent on the said dining hall for their warm dinners are compelled to rush to the various down-town eating establishments, where a higher priced but often inferior bill of fare awaits them, or else subsist on the cold meat-and-bread lunch which few students have the constitutions to long withstand.

We, the undersigned, do humbly petition you, the Board of Regents of the Kansas State Agricultural College, to take such measures as will cause the immediate reopening of the said dining hall. We also petition that Mrs. Hanson be made purchasing agent for said dining hall establishment and continue as superintendent and manager.

Voted that persons desiring the use of the college dining hall be permitted to use the same, including the kitchen and utensils, during the remainder of the present term, said use to involve no expense to the College; provided Mrs. Mary L. Hanson will assume control and responsibility for the business and equipment, looking to the receipts from the dining hall for her compensation.

The board voted to re-lease for two years, at the rate of \$230 per annum, the 120 acres of Williston land lying to the north of the college grounds.

President Fairchild, on leaving before the adjournment of the board, left the following appointments: Committee to submit course of study, or synopsis thereof, to the committee on course of study at

earliest practicable time—Professors Nichols, Ward, Winston, Hitchcock, Willard, Stoner, Cottrell and Harper.

The difference of \$15 per month between the salaries of Messrs. Clothier and Westgate was retained by the general fund of the College after May 1, instead of being added to the appropriation for the Botanical department.

The following recommendation of the secretary was adopted: That \$250 be expended from the executive fund for actual expenses incurred by college teachers in visiting teachers' institutes and lecturing on the College; and that teachers not otherwise connected with college duties during summer vacation be requested to do such work in so far as practicable.

Regent Satterthwaite brought up the question of delivery of the coming commencement address by Hon. Wm. J. Bryan. Regent Yoe offered the following resolution:

WHEREAS, The former Board of Regents invited Hon. Wm. J. Bryan to deliver the commencement address at the Agricultural College in June, and

WHEREAS, The present Board of Regents are opposed to giving this occasion a political significance,

Resolved, That we are opposed to his coming, and we request that some gentleman not recognized as a politician be invited to make the address.

On roll-call the vote stood as follows: Aye—McDowell, Yoe, Hunter and Satterthwaite. No—Vrooman and St. John. The resolution thereupon was declared carried. Upon motion of Regent Yoe it was voted that President Will be requested to select a commencement speaker.

Treasurer-elect Yoe filed his bond as treasurer in the sum of \$50,000, said bond being signed by W. T. Yoe; the First National Bank of Manhattan, Kan., by Geo. S. Murphey, president, and George K. Helder, cashier; Geo. S. Murphey, W. I. Richards, Charles Day, and C. F. Little. On motion of Regent Hunter the bond was accepted and approved. On motion of Regent Hunter, Treasurer-elect Yoe was permitted to appoint a deputy treasurer until the end of the present college year in the person of Mr. George S. Murphey, president of the First National Bank of Manhattan.

On motion of Regent Vrooman the minutes of the current meeting were read and approved.

The board adjourned to meet at the College, Tuesday, June 6, at 9 A. M.

ECONOMICS IN AMERICAN COLLEGES AND UNIVERSITIES.

BY E. W. BEMIS.

THREE terms of economics are now given at the K. S. A. C., and one term of industrial history, which is divided between history and economics. Mention might also be made of chapel lectures in these subjects, one hour a week during the fall term. One of the three terms above mentioned is required of only about one-half of the students of the Senior class this year, and the professor in charge has advised that the term henceforth be made elective for all students, as proposed in the course of study reported by the proper committee in April. In view, however, of the claim that too much economics is taught at the K. S. A. C., and the implication that only radical institutions would introduce so full a course, it is interesting to observe what is being done in the strongest and most conservative institutions in the country. Unfortunately several institutions which have been addressed and which are known to have very extensive departments of economics and sociology, such as Yale, Cornell, the Johns Hopkins, and the state universities of Michigan and Minnesota, have not yet sent catalogs, but enough data are at hand to prove that the most conservative of our great institutions are devoting a vast amount of time and money to this work.

The University of Chicago, in its department of economics and the allied department of sociology, has two head professors receiving \$7,000 each, eight other professors, and several instructors. The total of the salaries for instruction in these two departments, to say nothing of numerous fellowships, or of the work of history and political science, is about \$40,000. A mere title of the courses in economics will give some idea of their scope and of the respect paid to the subject by this creation of the Standard Oil Company. They are in part as follows: Principles of Political Economy; Advanced Political Economy; Economic and Social History; Processes of Leading Industries; History of Political Economy; Scope and Method of Political Economy; Economic Theory; Social Economics; Practical Economics; Socialism; Economic Factors in Civilization; Finance; Railway Transportation; Comparative Railway Legislation; Railway Accounts, Exchanges, etc.; Tariff History of the United States; Problems of American Agriculture; Financial History of the United States;

Statistics; Money and Practical Economics; Banking; Colonial Economics; Natural Resources of the United States; and any number of courses under the title of sociology, such as Primitive Social Control, the Family, the Labor Movement, Social Treatment of Crime, Philanthropy, American Experience with State Control of Social Action, Democracy and the Social Movement in the Nineteenth Century, and Education as a Social Function.

Turning next from the newest to the oldest of our universities we find at Harvard fully twenty courses in the department under consideration, for example: Outlines of Economics, History and Literature of Economics, Economic Theory, Socialism and Communism, the Medieval Economic History of Europe, Western Civilization in its Economic Aspects, the Industrial Revolution in England, Economic History of the United States, the Labor Question in Europe and the United States, Statistics, Railways and other Public Works, Finance, Banking, Money, the Ethics of Social Questions, etc.

Columbia University, in New York, with four professors in economics and social science, receiving \$5,000 or more each, and with several assistants, offers twenty-four different courses along the same lines as the institutions above mentioned. Even Princeton, the most conservative of the great eastern universities in all directions, has two professors and three associate professors in these lines and offers twenty-one courses.

Some of the state institutions are also beginning to wake up to the importance of these subjects, which are even more appropriate to them than to private endowed institutions, since state institutions, supported by public taxes, should prepare for citizenship, if they prepare for nothing else.

The course at the University of Ohio is much like that at Manhattan, only more extensive, since there are over twelve courses. The University of Illinois offers twenty courses. The University of Wisconsin not only has Professor Ely but three or four others as teachers of this subject. Eighteen courses are offered in economics and sociology. Professor Ely's Socialism and Social Reform, which is used as a text book during one of the terms at Manhattan, in connection with lectures, is also used at the Johns Hopkins University, University of Boston, University of Wisconsin, University of Missouri, Lawrence University, and the universities of Iowa and Colorado, while other text-books by the same author are in use at Leland Stanford and Brown universities, Smith and Swarthmore colleges,

the universities of Illinois, Indiana, Kansas, Colorado, and several other strong institutions.

So necessary are these subjects now considered to even a moderately liberal education that much attention is paid to them even in high schools of any pretensions in the East, while it is well-known that the congressional act of 1890 grants every agricultural college \$25,000 a year—

To be applied only to instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural and *economic* science, with special reference to their application to the industries of life and to the facilities for such instruction.

The difference in amounts of economic instruction offered in other institutions in comparison with that provided in the Kansas State Agricultural College is further emphasized by the fact that the courses here are but about one-third of one year in length, while in the other institutions mentioned they are usually pursued during one-half year or one full year.

The fact that no complaint has been made in regard to the excessive amount of economics offered in the universities of Chicago, Harvard, Columbia, Pennsylvania, Stanford, etc., while at the same time the small amount offered in this institution has aroused criticism, furnishes much room for reflection. If the department is considered such a bugbear by many citizens of the state, it must be due to ignorance of the work done. The frequent presence of our critics in the class room would probably dispel their fears.



A SENSATION IN ROCKEFELLER'S UNIVERSITY.

THE University of Chicago, founded by John D. Rockefeller, is usually regarded as the headquarters for conservatism as regards social and economic questions. For this reason, if for no other, the following remarks, as reported in the newspapers, by Prof. Albion W. Small, of the chair of sociology, before the Methodist ministers, are noteworthy:

In this age of so-called democracy we are getting into the thrall of the most relentless system of economic oligarchy that history thus far records.

That capital from which most of us, directly or indirectly, get our bread and butter is becoming the most undemocratic, inhuman and atheistic of all the heathen divinities. It breeds children, only to devour the bodies of some and the souls of others, and to put out the spiritual eyesight of the rest.

In spite of the historic campaigns for liberty, in spite of the achievements of Christianity, there has never been a time since Adam was born when the individual counted for so little or availed so little as to-day.

Compared with any worthy conception of what society must become if life is to be tolerable, the socialistic indictments against our civilization are essentially sound. As abstract propositions, these diagnoses expose with approximate truth the ghastly inequalities and injustices which our present social order sacrifices.

It is a literal and cardinal fact that our present economic system cries to heaven for rectification. It stultifies human nature. It nullifies the purposes of God. The men who denounce present society have profound reason for their complaints. We are in the midst of the most bewildering labyrinth of social entanglements in which the human race has wandered up to date.

If you will heed the symptoms from bank and office and factory and railroad headquarters and daily press, you have discovered that the very men who are making these combinations are beginning to be afraid of their own shadows. These very business men, who claim to have a monopoly of practical common sense, have involved themselves and all the rest of us in a grim tragedy of errors.

They are already beginning to ask on the quiet how it is all to end. Whether they realize it or not, our vision of freedom is passing into eclipse of universal corporate compulsion in the interest of capital. The march of human progress is getting reducible to marking time in the lockstep of capital's chain gang.

I have no doubt whatever that the vast majority of capitalists are good capitalists. They operate strictly within the rules of the game. Nevertheless, capitalism is not a good game, and it is our business to see the reason why. The whole program of our present civilization turns at last on the calculation of effects upon the accumulation of capital.

We have turned moral values upside down. We are making men the means of making capital, whereas capital is only tolerable when it is simply the means of making men.

It would be infinitely more for human weal if every dollar of wealth should be cleaned from the earth, if we could have instead of it industry and honesty and justice and love and faith, than to be led much further into this devil's dance of capitalism.



Speaking of the recent trouble at this College, *Equity* (May 13, 1899) says:

Corporations and wealthy syndicates whose sole object is to exploit the people will never fail to avail themselves of an opportunity to delude the people by false economic teachings in their educational institutions.

Too many of our colleges are under the control of these corporate powers whose pecuniary gains would be perpetuated by keeping the people economically ignorant. They dread the light on economic questions and are therefore the natural foes to every tendency to increase the sum total of popular intelligence in regard to all matters which have a direct bearing upon their well-being as producers of wealth. The students in institutions controlled by these influences are trained with special reference to inspiring them with the hope that they can become wealthy and powerful by the perpetuation of our present unequal and

oppressive economic system. Political economy as taught in many of these institutions tends to so befog the natural faculties of the student, that he often seems to be incapable of arriving at any intelligent comprehension of the basic principles which underlie any great question, the decision of which affects for good or ill the great masses of the people.

Under the management of the present board of regents the Kansas State Agricultural College at Manhattan is a real educator worthy of an intelligent people. The improvements which have been introduced are most important in their character; and on their merits, if clearly presented, would receive the cordial endorsement of the great masses of the people. Therefore, we hope that the effort to undo the good that has been done will be resisted thru the courts so vigorously that the entire people may become conversant with all the facts, and at the same time become aroused to the imperative necessity of preventing corporate influences from dominating our state institutions of learning—and the control of all other state institutions should be taken out of the hands of mere politicians.



LOCAL NOTES.

C. E. Coburn, '91, is practising medicine in Kansas City.

A. C. Smith, '97, has gone to Alaska, to grow up with the country.

Miss Grace Secrest, '96, has returned to her alma mater to take a postgraduate course.

The commencement address will be delivered on June 8, by Rev. Benjamin Fay Mills, of Boston.

One hundred fifteen students have been enrolled in farm classes during the present college year.

The K. S. A. C. nine was beaten on the diamond by the Nebraska university nine. The score stood 10 to 1.

The College has again leased the 120 acres of land belonging to the Williston estate, lying just north of the college farm.

Each of the four companies of the battalion has taken a turn or two at the rifle range, but the records are not completed at this writing.

A farmers' institute was held at Blue Rapids, the other day, the actual cost of which was \$1.52. The average cost of the institutes thus far this year is \$7.69.

The announcement in chapel, last Saturday afternoon, that the dining hall would immediately reopen, was greeted with tremendous applause which for some time completely stopped the further reading of the notice.

The faculty party at Professor Nichols's, April 29, was a success in every particular. The Professor and his good wife certainly know how to entertain even an assorted lot of old pedagogs armed with queer scientific hobbies.

W. E. Smith, '93, got first prize at the social at Professor Brown's for being the best milliner. R. W. Clothier, '97, succeeded in taking the "booby."—*Students' Herald*.

Miss Grace Clark, '92, former stenographer to President Fairchild, left recently for Berea, Ky., where she has a position as secretary to the president of Berea College.

We are in receipt of a very interesting bulletin on Agriculture in Alaska, issued by the U. S. Department of Agriculture. The pamphlet was prepared by Prof. C. C. Georgeson and Walter H. Evans.

Mr. Geo. L. Clothier is expected back, about the twentieth of this month, from Cornell University, where he has studied seed breeding. On the return trip he will spend a short time at his old home in West Virginia, collecting specimens for the Botanical department.

Professor Cottrell has received an invitation to attend the opening of a new creamery at St. Francis, up in the northwest corner of the state, and give good advice to start off on. Unfortunately it is impracticable for him to go, as it would take him away from the College for too long, at a busy time.

More than usual interest seems to be manifested in the State Dairy Association that meets at the Agricultural College next fall. The object of this meeting is to discuss the pure butter subject and how to make more of it, and the relation of the farmer to the creameries. It is a subject of great importance to Kansas farmers.

Mr. F. S. Hurd, Meriden, Kan., president of the state dairy association, writes for one thousand copies of bulletin No. 88, "Keeping Milk in Summer," which he wishes to distribute among his patrons. Mr. Hurd has four of our dairy school students employed in his creamery this summer, and reports that they are doing unusually good work.

The following item concerning an ex-regent of the College, is going the rounds of the press: "Rev. Philip Krohn is now living in extreme poverty in Candor, N. Y. A year and a half ago he was paralyzed and since that he has not been able to speak or walk. He hears with great difficulty." Rev. Dr. Krohn was a regent of this College in 1883-85.

The Dewey Day celebration at the opera house, May 1, was the success of the year. Every seat was taken, and standing room was at a premium. The college cadet band looked well in their new uniforms. Hon. Sam Kimble made a very interesting and patriotic address which was heartily applauded. The music was under the direction of Professor Brown.

"Investigations of the Growth of Alfalfa in Kansas," is the title of experiment station bulletin No. 85. The bulletin is the joint work of the Botanical and Farm departments, having been prepared by George L. Clothier, assistant botanist, and H. M. Cottrell, professor of agriculture. Parties desiring this very valuable pamphlet should send their names to the Experiment Station of this College.

Professor and Mrs. Metcalf, assisted by the Wagner Symphony Club, R. H. Brown, director, gave one of their popular "Metcalf Recitals," in Wareham's Opera House, Manhattan, Monday night, May 22. The entertainment consisted of literary recitals in monologue and dialogue, including interpretations of dramatic scenes, and partaking of the humorous, pathetic and dramatic, interspersed with fine music.

Mr. F. L. Stewart, of Murrys ville, Pa., called at the Experiment Station recently. He is investigating the climate and possibilities of Nebraska and Kansas with regard to the cultivation of corn for sugar. By stripping the ears from the corn at the right stage, a large sugar content can be reliably secured in the juice; and Mr. Stewart is trying to get the beet sugar factories to take up the manufacture of corn sugar, which will considerably extend the working season of the factories. He carried off a selected bunch of station bulletins, and left a dollar for THE INDUSTRIALIST.

The Veterinary department of the Kansas State Agricultural College will issue consecutively several bulletins on blackleg, marked A, B, C, etc., which will include a general review of this disease, and show plainly just what is being done, as well as the benefits offered to the Kansas farmers by this department. Blackleg vaccine has become an important laboratory product at the Kansas State Agricultural College, and is furnished free to all applicants. Printed directions explaining how to vaccinate are furnished with every order. Sufficient vaccine has already been distributed to vaccinate over 25,000 head of calves.—*Hays City Republican*.

Ed. H. Webster writes from Manhattan to the *Yates Center News*: "If there is a young man in Woodson county who expects to enter farming as his life occupation, he can begin no better than by saving \$50 between now and the first of January next, and then come here to the College and take either the creamery patron's course, or the home dairy course. Each course is three months in length and entirely free to all, board and books being the only cost. The new dairy school will be equipped with the best and latest apparatus for both creamery butter-making and home butter-making, and factory cheese making. Expert instructors will be employed in every line, and the value derived from taking such a course will be well worth the time and cost to any young man, or older man either, who is going to stay by the farm."

Alaska now has a regular experiment station; it is under the direct supervision of the United States Department of Agriculture. The Experiment Station Record states as follows: "Professor Georgeson will remain in charge of the work, and will reach Alaska about the middle of April. He will take with him Mr. C. H. Robinson, a graduate of the Michigan Agricultural College in 1895, as assistant at Sitka, and Mr. H. P. Nielsen, formerly of the Kansas Agricultural College, as assistant at Kenai for the summer. He has also engaged three laborers to go to Alaska for the summer, as there is difficulty in procuring satisfactory farm laborers there. Several yoke of oxen will be shipped there from Oregon, and a full line of

implements, including wagons, stump pullers, plows, cultivators, harrows, hand tools, etc., will be taken More restricted experiments in growing cereals and vegetables were made at Skagway by a settler in that place who was formerly connected with the Kansas Agricultural College."

An item in the *Kansas City Times* refers to our Max G. Spalding, '96: "Max G. Spalding, 26 years old, has a fractured skull as the result of an accident which occurred yesterday afternoon at the Minneapolis Threshing Machine Company's building, 1312 West Eleventh street. By means of a derrick, Spalding was hoisting a separator from a flat car. While the machine was suspended, the brake holding the derrick handle was released by Spalding to lower the machine. The handle got away from him and flying around struck him on the right temple, fracturing his skull. The machine fell to the ground with a crash, just missing four workmen who had been assisting. They ran to his assistance and one of them called the police ambulance with Dr. Manahan. The latter gave Spalding temporary treatment and took him to St. Joseph's hospital."

The following good words for the Mechanical department are gleaned from the *Manhattan Mercury*: "The Mechanical department of the Agricultural College has under construction half a dozen modern six-foot screw-cutting lathes that would attract the attention of any judge of fine workmanship. To commence with, Professor Harper obtained permission from the owners of patents, on account of the extensive purchases the College had made of them, to make these lathes for use in the college shops. Superintendent House made the patterns and the work went thru the various stages. Four of the machines will be completed by Commencement. The new 18-inch face, 12-foot pattern-maker's lathe recently added to the wood shops is what Mr. House has been working on for the past three years, and is proving one of the most useful machines in the department. Professor Harper has the most enthusiastic set of students about the Mechanical department the College ever had, and we believe it is caused by the splendid work done and the practical way in which he goes at it."

NOTES FROM THE HORTICULTURAL DEPARTMENT.

The east entrance to Lovers' Lane is being rearranged and fitted up with cut stone posts to correspond with the east entrance to the main drive. This improvement has long been needed and will add an imposing feature to that part of the grounds.

Bulletin No. 84, on "Cold Storage for Fruit," is in great demand. Before it had been distributed two weeks, special requests for it had been received from 26 different states. It is the first bulletin issued in the United States giving results obtained in the keeping of fruits by cold storage. As long as the supply lasts copies may be had free, by request from the Horticultural department.

The horticultural museum is being equipped with a collection of fungous diseases such as are parasitic on horticultural crops. The specimens will be shown in glass bottles such as are used for exhibit-

ing fruits. Drawings have been prepared showing the microscopic characters of the fungi. The collection will be of great value as a means of illustration in class work. Mrs. Bertha (Kimball) Dickens, '90, is preparing the drawings.

An interesting experiment is in progress on the improvement of strawberries by selection. The plants are given the best of culture and are allowed to bear but a limited quantity of fruit. Plants are propagated from these and the young plants so propagated will be placed in a new bed and be given the same careful culture and treatment. It is only by such experiments carefully and patiently carried out year after year that the highest types of fruits are to be expected.

COMMENCEMENT WEEK.

Saturday, June 3.—Recital before the literary societies, in College Chapel, by Prof. and Mrs. F. A. Metcalf assisted by the Wagner Symphony Club, at 8 P. M.

Sunday, June 4.—Baccalaureate sermon, in College Chapel, by President Will, at 4 P. M.

Tuesday, June 6.—Examinations from 9 A. M. to 3:35 P. M. Class-day exercises for invited guests of class of '99, at 8 P. M.

Wednesday, June 7.—Examinations from 9 A. M. to 3:35 P. M. Public address before the Alumni Association, in College Chapel, by John W. Shartel, class of '84, at 8:00 P. M.

Thursday, June 8, Commencement Day.—Annual address by Rev. Benjamin Fay Mills, of Boston, Mass., at 10 A. M. Presentation of Diplomas. Cadet band concert on east campus at 2:00 P. M. Military drill at 2:45 P. M. Business meeting of the Alumni Association, in College Chapel, at 4:30 P. M. Triennial reunion of Alumni and invited guests, at 7:30 P. M.

Public conveyance to and from College in connection with all exercises. Dinner on Thursday served in College Dining Hall.

FIELD DAY NOTES.

May 8 was field day. The weather was propitious, but there was only a light attendance of spectators to witness the various maneuvers. Below we give the names of the winners and the record made for first place:

Dash, 100 yards, 11 sec.—Spencer, Zirkle, Hanson.
 Pole vault, 8 ft. 6 in.—Howard, Perry, Wise.
 Shot put, 32 ft. 9 in.—Howard, Butterfield, Durant, Avery.
 Run, $\frac{1}{4}$ mile, 2 min. 16 $\frac{1}{2}$ sec.—True, Roe, Drown.
 Swinging jump from pole, 14 ft. 5 in.—Howard, Sparks, Durant, Butterfield.
 Hurdle race, 15 $\frac{3}{4}$ sec.—Zirkle, Perry, Howard.
 Wheel race, $\frac{1}{4}$ mile, 1 min. 23 $\frac{3}{4}$ sec.—Avery, Snyder, Cannon.
 Hammer throw, 72 ft. 3 in.—Durant, Butterfield, Bourne, Jolley.
 Run, 220 yards, 25 $\frac{3}{4}$ sec.—Spencer, Zirkle, Hanson.
 Standing high jump, 4 ft. 3 in.—Butterfield, Perry, Howard, Leonard.
 Ball throw, 306 ft.—Howard, Durant, Perry, Butterfield.
 Mile walk, 9 min. 48 $\frac{1}{2}$ sec.—Nelson, Jolley, Boardman.
 Running high jump, 5 ft. 1 in.—Perry and Howard tied, Butterfield, Wise.
 Run, 440 yards, 53 $\frac{3}{4}$ sec.—Spencer, Powers, Snodgrass.
 Standing broad jump, 9 ft. 7 in.—Butterfield, Burson, Howard, Leonard.

Relay race, 1 mile, 4 min. 56½ sec.—Bean, Roc, Spencer, Burson; Zirkle, Wise, Blachly, Leonard; Brown, Hanson, Sweet, Brigham.

Wrestling mill—Drown, Dern, Swingle; Brow, Sparks, Avery; Durant, Drown, Finch.

Running broad jump, 17 ft. 6 in.—Spencer, Howard, Snider.

Bicycle race, 2 miles, 5 min. 53¼ sec.—Avery, Snodgrass.

The following table shows the points won by the 1st, 2d, 3d and 4th years respectively in each event, the 2d years being the winners of the day:

| EVENTS. | First. | Second. | Third. | Fourth. |
|-------------------|--------|---------|--------|---------|
| First | 4 | 5 | 3 | 0 |
| Second | 3 | 4 | 5 | 0 |
| Third | 3 | 0 | 5 | 4 |
| Fourth | 0 | 4 | 3 | 5 |
| Fifth | 3 | 4 | 5 | 0 |
| Sixth | 5 | 4 | 3 | 0 |
| Seventh | 4 | 5 | 3 | 0 |
| Eighth | 5 | 3 | 0 | 4 |
| Ninth | 4 | 5 | 3 | 0 |
| Tenth | 0 | 4 | 3 | 5 |
| Eleventh | 4 | 3 | 5 | 0 |
| Twelfth | 3 | 5 | 4 | 0 |
| Thirteenth | 0 | 4½ | 4½ | 3 |
| Fourteenth | 4 | 5 | 3 | 0 |
| Fifteenth | 0 | 4 | 3 | 5 |
| Sixteenth | 4 | 5 | 3 | 0 |
| Seventeenth | 3 | 4 | 5 | 0 |
| Eighteenth | 3 | 5 | 4 | 0 |
| Nineteenth | 0 | 5 | 4 | 0 |
| Total | 52 | 78½ | 68½ | 26 |

BATTALION ROSTER.

Cadet Major and Acting Commandant..... ROBERT B. MITCHELL.

STAFF.

First Lieutenant and Adjutant..... C. D. MONTGOMERY.

First Lieutenant and Quartermaster..... F. HOWARD.

NONCOMMISSIONED STAFF.

Sergeant Major..... R. E. EASTMAN.

Color Sergeant..... GEO. OWENS.

Chief Trumpeter..... W. RIDDLE.

Chief Signal Corps..... JOHN WYSE.

Drum Major..... PAUL PIERSOL.

COMMISSIONED AND NONCOMMISSIONED OFFICERS OF THE LINE, BY COMPANIES.

| RANK. | Company A. | Company B. | Company C. | Company D. |
|-----------------------|---------------------|-------------------|-------------------|-----------------|
| Captain | A. E. Blair..... | Frank Shelton.. | Roscoe Nichols.. | J. A. Harvey. |
| First Lieutenant..... | L. E. Potter..... | H. D. Orr..... | Roland McKee.. | Chas. Eastman. |
| Second Lieutenant.. | C. A. Scott..... | Geo. Greene.... | D. B. Swingle... | A. I. Bain. |
| First Sergeant..... | H. F. Butterfield.. | G. W. Hanson.... | W. F. Lawry.... | B. Thompson. |
| Second Sergeant..... | B. Poole..... | John Powers.... | C. C. Turner.... | H. H. Riley. |
| Third Sergeant..... | E. C. Cook..... | B. F. Mudge.... | R. A. Bower.... | J. Oesterhaus. |
| Fourth Sergeant..... | E. V. Roe..... | Chas. Edwards.. | G. F. Bean..... | Fred Myers. |
| Fifth Sergeant..... | C. J. Burson..... | H. A. Dieball.... | H. A. Avery..... | H. Adams. |
| First Corporal..... | D. C. Deming..... | F. W. Haslewood | H. S. Bourne.... | H. T. York. |
| Second Corporal..... | H. Baker..... | E. E. Chronister. | J. T. Stafford... | C. Davidson. |
| Third Corporal..... | H. H. Fay..... | R. F. Triplet.... | R. S. Cole..... | C. A. Gingery. |
| Fourth Corporal..... | J. F. Ross..... | J. D. Hanson.... | H. N. Vinall.... | J. E. Snyder. |
| Fifth Corporal..... | R. Faris..... | V. M. Emmert... | C. F. Smith..... | C. O. Sparks. |
| Sixth Corporal..... | L. Rigg..... | H. C. Williams... | E. H. Zirkle..... | H. P. Richards. |

ATTENTION ALUMNI!

MANHATTAN, KAN., March 25, '99.

To the Members of the Alumni Association of the Kansas State Agricultural College:

I hereby give notice that the following amendments to the constitution and by-laws of the association will be presented for consideration at the next annual meeting, June, 1899. ED. H. WEBSTER, '96.

AMENDMENTS TO CONSTITUTION.

ART. 3. The officers of the association shall be a president, a vice-president, a secretary, a treasurer and a correspondent of the *Students' Herald*.

ART. 5. The business of the association during the intervals between the annual meetings shall be in the hands of an executive committee, which shall consist of the officers of the association and two other members, who shall be elected by the association at each regular meeting. No two members of the executive committee shall be of the same class.

ART. 7. The officers shall be elected by the association at each annual meeting, and shall hold office for one year or until their successors shall have been elected.

ART. 8. (1) This constitution may be amended by a three-fourths vote of all members present at any regular meeting, providing the proposed amendment shall have been published at least one month previous in the *Students' Herald*.

AMENDMENTS TO BY LAWS.

SECTION 1. There shall be triennial reunions of the association at the Kansas State Agricultural College, to be provided for by the executive committee, unless otherwise ordered by the association.

SEC. 2. The expenses of each reunion shall be met by a uniform assessment upon all the members in attendance.

SEC. 3. The board of regents and the faculty of the College, the wives and husbands of members of the association not themselves members, and such prominent persons as the executive committee or the association shall see fit to invite, shall be guests of the association at its reunions.

SEC. 4. The executive committee may provide for an address to be delivered before the association, by one of its members, on the occasion of the triennial reunion.

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J. H. ETHERIDGE, M. D.

33 Washington Street, Chicago.

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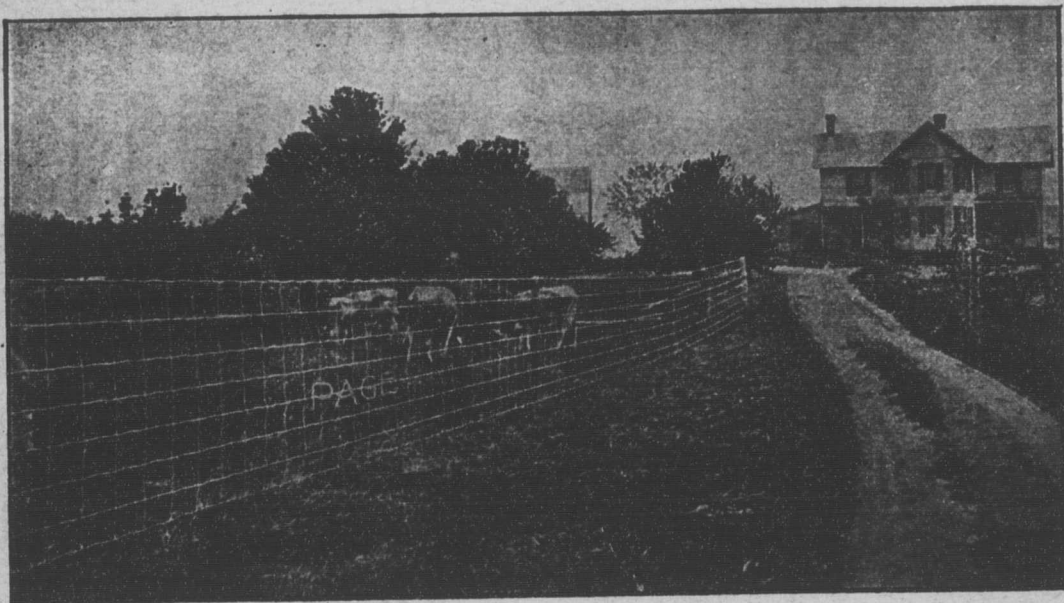
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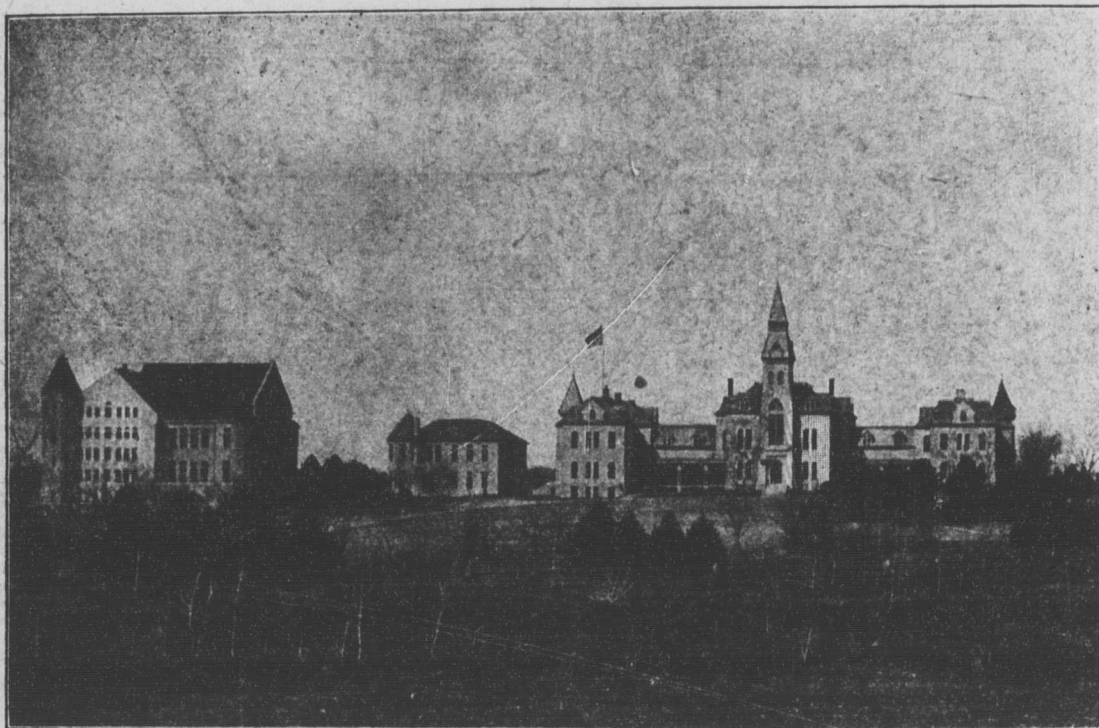
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PRES. THOS. E. WILL, Manhattan, Kansas.

July, 1899.

{ Vol. 25. No. 7.
{ Whole No. 1024.

THE INDUSTRIALIST.

Issued 10 times per year by the
KANSAS STATE AGRICULTURAL COLLEGE.

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for the
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of
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Industrial
and
Civic
Education.



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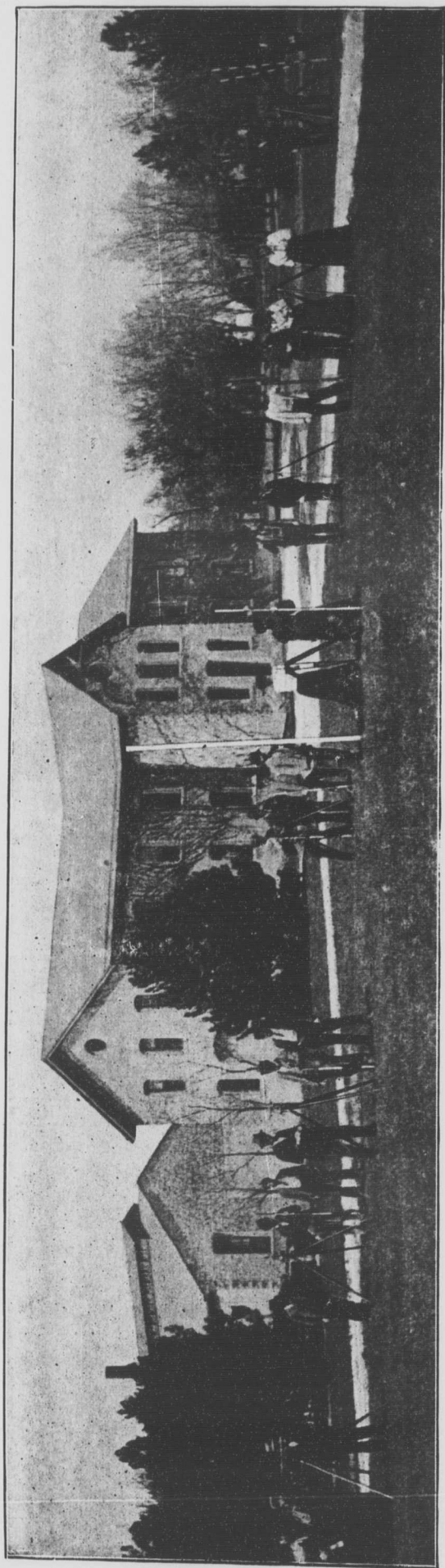
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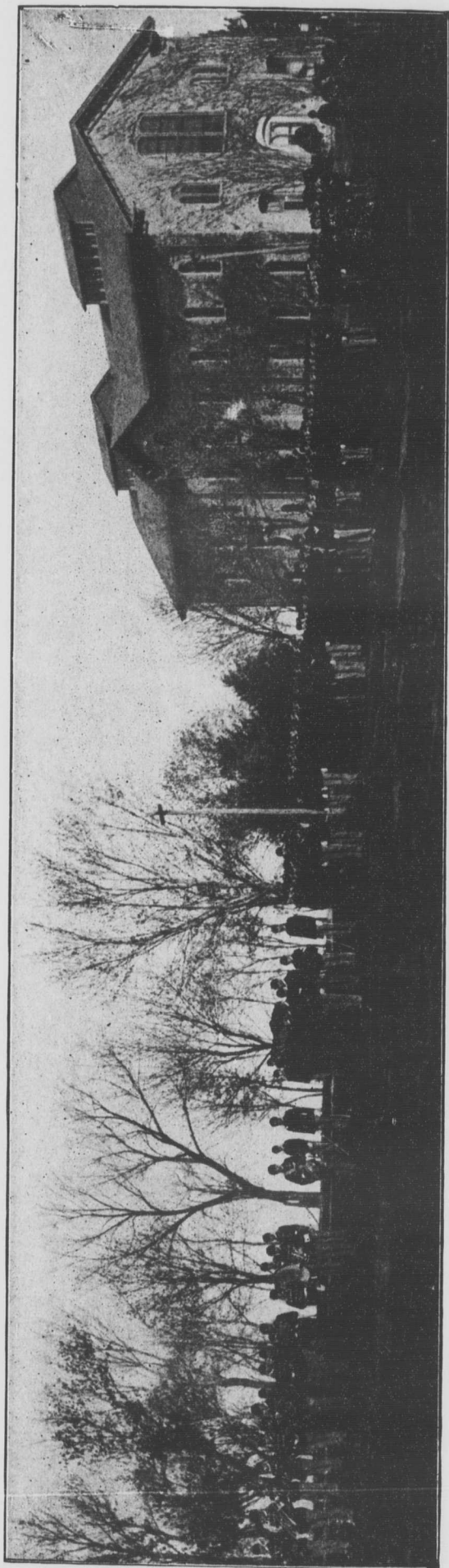
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SURVEYING SQUADS.—IRON AND WOODWORK SHOPS.



COLLEGE BATTALION.

THE INDUSTRIALIST.

Manhattan, Kansas.

Vol. 25, No. 7.

July, 1899.

Whole No. 1024

HEROISM.

Baccalaureate Sermon before the Class of 1899, Delivered June 4.

BY PRESIDENT THOMAS ELMER WILL.

Quit you like men. Be strong.—1 Cor. xvi, 13.

EVERY age demands its leaders, its heroes and deliverers. The children of Israel are slaves in Egypt, their lives embittered by hard bondage. Their cry ascends to the God who notes the sparrow's fall and hears the young ravens when they cry. He raises up one from the ranks of their brethren, trained in Pharaoh's court, learned in all the wisdom of the Egyptians; and Moses delivers his people out of the hands of Pharaoh and out of the house of bondage.

Orientalism, personified by Persia, threatens to overwhelm liberty and civilization as represented by the little republic of Hellas. Xerxes with his myriad hosts is advancing and the thunder of their tread shakes the earth and appalls hearts as yet unused to fear. But the champion of Greece appears. Leonidas, with his three hundred Spartans, takes his stand in the pass of Thermopylæ. Against the Spartan spears the Persians dash as ocean waves stirred by the tempest dash against the cliff. Again and again they are hurled back, till treachery turns the pass and the brave Spartan band are slain. But the moral gain remains, undying. Close on the heels of Thermopylæ come Salamis and Plateæ; and the Persian is expelled, never to return.

Now the liberties of ancient Rome are threatened by the Aequians; Cincinnatus is called from the plow, the enemy are overwhelmed, and the seed of a great civilization is saved. Again, it is the Etruscans who menace the life of the little city by the Tiber, and again the deliverer arises; Horatius at the bridge holds the entire army of the foe at bay until the bridge is destroyed and invasion made impossible.

France of the Middle Age is in sore straits. Victory after victory has rewarded the English arms; all of France north of the Loire has fallen into their hands and an English child has been proclaimed

king of France. Burgundy has joined the enemy. France as a nation is threatened with dismemberment and extinction. In this crisis a leader arises—a peasant maid, a keeper of sheep. To her, angel voices have whispered that it is she who must deliver her native land from the spoiler and preserve the identity of her country. With her to hear is to obey. Strong in the faith that God is with her, she visits the court of Charles the Dauphin, secures command of the armies of France, raises the siege of Orleans, puts the English to flight and secures the coronation of her king.

England is governed by a despot, deluded by the theory that he possesses the divine right to rule wrongly. Driven to desperation by a depleted treasury he signs the Petition of Right only to trample it beneath his feet as John trampled the Magna Charta while still wet with the ink of his signature. With Star Chambers and High Commission Courts and ship money he vexes the nation, until, at last, by his attempted seizure of members of parliament, he drives it into revolt. England rises against her monarch in civil war. The man of destiny appears. Backed by his "invincible ironsides," Oliver Cromwell becomes the first man in England. He defeats the king, purges parliament, abolishes the monarchy, establishes the commonwealth, subdues Ireland and Scotland, brings the Dutch to terms, reforms abuses and raises England to the foremost place among the nations of the world.

Again, a nation has been born beyond the western sea; as yet it is in swaddling clothes and exists only as a cluster of colonies. It is held as a means of gain by those who profess to protect and cherish it. Burdens grow more grievous; stamp acts and navigation acts, taxes on tea, port bills and transportation bills accumulate until the last straw breaks the camel's back and America declares her independence. Again, the hour finds the man. Samuel Adams, the man of the town meeting; Patrick Henry, demanding liberty or death; Jefferson, with burning pen, writing the declaration; and Washington, the military genius, all are here. The dreary years from Lexington to Yorktown drag by and America is free.

Not only do great national crises call forth leaders and deliverers; now and again there arise great moral and religious issues which must be faced if the race is to take the next advanced step in its progress. The history of the crusades affords an example. For centuries pious pilgrims had wended their way to Palestine to retrace the steps of the Man of Galilee, to gaze upon the places hal-

lowed by his memory and to weep and pray at his tomb. But the Holy Land passed under the control of a people who scorned the places and memories held sacred by the Christian, turned churches into stables, imprisoned the venerable patriarch of Jerusalem and insulted and oppressed the palmers. Among these pious pilgrims was the hermit Peter. He saw and experienced the abuses and indignities heaped upon his fellow Christians. Burning with indignation he returned to the western world and told his story with irresistible eloquence and fervor. Pope Urban espoused his cause. Together they aroused the council of Clermont till, as with one voice, the assembled multitudes cried "God wills it! God wills it!" and donning cross and sword started upon the movement which for two centuries was to absorb the best blood and treasure of Christendom.

The Protestant Reformation, again, affords an example. The Christian church in the sixteenth century had grown corrupt, immoral, greedy of temporal power and wealth and reckless alike of the material and spiritual prosperity of the people. Shepherds flayed the flocks whom they were appointed to feed, and silenced the voice of criticism by the hand of authority. The papal tiara had become an object of purchase and had been worn by one whose children were "prodigies of infamy and crime." To supply the papal treasury indulgences were sold, which in the hands of Tetzels were little better than licenses to sin. The moral sense of the devout was shocked. Might not the church be reformed and purified? If not, could it endure, and retain its hold upon the respect and love of men? Among such questioners was Martin Luther. He denounced the sale of indulgences, fearlessly defined his faith in his ninety-five theses, challenged the comparison of his views with Holy Writ, publicly burned the papal bull denouncing his teachings, met his opponents at Worms, from which assembly he could not be kept "tho there were as many devils there as there were tiles on the roofs of the houses," proclaimed to the world the doctrine of justification by faith and rent half of Europe from its allegiance to the holy see.

Instances might be multiplied. The horrors of the Crimean War called forth a Florence Nightingale; the living death of the victims of England's penal system aroused a Howard; American slavery raised up Garrison, Phillips and Harriet Beecher Stowe; the curse of drink stirred the zeal and inspired the devotion of Frances Willard; while the sufferings of Cuban reconcentrados enlisted the sympathies and aid of Clara Barton and her noble band of soldiers of the Red Cross.

Not only in the world of action and in that of emotion, but in the world of thought as well is the hero and leader demanded. Knowledge grows from age to age. It grows with infinite slowness. In the beginnings ignorance covered the earth as the waters cover the great deep, and the race groped like blind men in the thick darkness. The ancients, so called, so far from being the sages and seers were the children of the race. Like children they were forced to learn, if at all, by experience and by the slow accumulations of discoveries. Unlike children, they had no teachers to impart to them in months the wisdom of the ages. Naturally their conceptions were childish. Ages must needs elapse before men were able to put away childish things. When countless centuries had passed they still thought of the Deity as a man, sitting on a throne, making sun, moon and stars with his hands and "hanging these from the solid firmament which separates the heavens above and overarches the earth beneath." Later they thought of him as "speaking" the worlds into being; creating them out of nothing; accomplishing this mighty task in six days of twenty-four hours each, or instantaneously, or both, and completing it on a fixed and definite historical date. Man was made by the Creator out of literal earth as a vase is made by the potter, and woman was made from one of his ribs. The Creator, wearied with his six days' labor, was now thought of as resting on the seventh from his works, walking in his garden in the cool of the day, and talking familiarly with men.

The universe was conceived of as a house. The earth was its ground floor, and flat like a table; its ceiling was the solid firmament; this floor constituted also the floor of the second story or heaven, the abode of angels. In the second story was a huge tank from which the earth was watered by the angels, who, at irregular intervals, opened the windows of heaven and sent down the showers. The succession of day and night were also indirectly controlled by the angels who pulled and pushed about under the firmament the heavenly bodies, sun, moon and stars. The sphericity of the earth, tho occasionally suggested, was not to be thought of; nor was the idea of the antipodes. How, it was asked, could men hang to the planet by their feet with their heads downward? How, while on the under side of the earth, could they witness the second coming of Christ? Again, how could their wretched souls be saved unless Christ had lived also on their side of the earth and repeated for them his sacrificial offering?

Later, however, came the geocentric theory, according to which the earth was the center of the universe. Around the earth revolved, thru the direct action of the angels, nine transparent globes or spheres, to each of which was attached one or more heavenly bodies. Outside of all was the tenth sphere, called the empyrean, beyond which was the formless void inhabited only by the Infinite and his attendants. Here sat Jehovah on his throne, soothed by the music of the spheres slowly revolving beneath him. Below the earth, a vast cavern lighted by infernal fires and resounding with shrieks, groans and curses, was hell, the abode of the lost, presided over by the fallen angel Lucifer; while swarming upon the earth and in the air were angels of light ministering to man's needs, and imps of darkness tempting him to sin and sowing the dragon's teeth of discord and death. One set of heavenly bodies not held in place by the spheres were the comets. These were "signs and wonders," balls of fire hurled from the fist of an angry God, warning men against their sins and presaging the death of princes.

Geological conceptions were equally grotesque. St. Jerome maintained that the "broken and twisted crust of the earth exhibits the wrath of God against sin." Fossils were due to the agency of "a stone-making force," or a "formative quality," or they grew from seed, or were spontaneously generated and "possessed powers of reproduction like plants and animals."

Even until to-day among vast numbers, and despite the researches of anthropologists, ethnologists, and historians, and the complete and absolute triumph of the evolution philosophy among the scholars and thinkers of the world, there still survives the doctrine that man was created perfect and complete, that he fell, and that this "fall brought death into the world and all our woe, with loss of Eden." The doctrine of witchcraft has ruled Christendom with a rod of iron; literal obedience to the mandate, "Thou shalt not suffer a witch to live," has established a reign of terror, and clothed civilization in sackcloth. Storms, devastating fields and vineyards, diseases, accidents and calamities were for centuries attributed to witches, human beings in league with the devil. These unhappy wretches were put to the torture; fire, thumb-screw, and rack were brought into play; and, amidst agonies worse than death, confessions were extorted that but confirmed the belief in the fell superstition. In such circumstances none were safe. To profess disbelief in witchcraft and to protest against the monstrous delusion was to draw suspicion

upon oneself. As in the Terror in France, personal safety could be secured chiefly thru zeal in persecution. Thus was written one of the blackest pages in human history. A single judge boasted that in fifteen years he had sent to their death fifteen hundred persons for this imaginary crime.

To fasten the more firmly upon the human mind these beliefs, all childish and absurd, and some leading to monstrous cruelty, the sanctions of religion were invoked in behalf of each and all. According to the sentiment of the times, to doubt folly and superstition was to doubt God and all goodness. To oppose error was to oppose truth. To favor the progress of knowledge and the diffusion of light was to array oneself with the lowest and vilest of criminals. No punishment was too severe for him who dare oppose ignorance and bigotry, especially when sanctioned by immemorial usage and buttressed by church and state. The mighty genius of Descartes, grappling with a rational conception of the universe evolving in obedience to an inward principle instead of being carpentered together according to the current orthodox theory, was crippled by "an almost morbid fear of the church." Peter of Abano (1316) teaching the doctrine of the existence of antipodes "only escaped the Inquisition by death." Cecco D'Ascoli, for the same crime, was brought under suspicion of sorcery, "driven from his professorship at Bologna and burned alive at Florence." Copernicus, who mortally offended the dominant sentiment of his time by proclaiming the startling doctrine that the earth moves around the sun rather than the sun around the earth, delayed thirty years the publication of his heresy and then escaped torture only by death. In 1829 Thorwaldsen's statue of Copernicus was unveiled in Warsaw. Tho a pious Christian of most exemplary life, the memory of this great astronomer even at this late day was insulted by the refusal of any priest whatever to be present and officiate at the ceremony. Upon the followers of Copernicus were heaped equal and even greater insult. Rheticus and Reinhold, astronomical professors of high rank in the University of Wittenberg, after thoro study, had convinced themselves that the Copernican system was true, but neither was allowed to tell this truth to his students. The first abandoned his professorship that he might enjoy "freedom to seek and tell the truth." The other basely retained his chair and advocated a doctrine he believed to be false while opposing the one he felt to be true.

Next in order came Giordano Bruno, who dared, even within the

hearing of the papacy, to utter plainly the new truth. For this he was "hunted from land to land," entrapped, imprisoned for six years, and at last burned alive and his ashes given to the wind (1600).

Following Bruno came Galileo, who, with his telescope, proved the truth of Copernicus's hypothesis. Upon him now was concentrated the entire fire of orthodox opposition. He was denounced as a disbeliever in scripture, an "infidel" and an "atheist;" was investigated (1615) by the Inquisition, convicted of heresy and commanded to abandon forever the opinion reached thru the evidence of his telescope. Galileo acquiesced, but broke his promise and continued to propagate his doctrine. In 1631 one of his chief accusers, the Jesuit, Melchior Inchofer, declared:

The opinion of the earth's motion is, of all heresies, the most abominable, the most pernicious, the most scandalous; the immovability of the earth is thrice sacred; argument against the immortality of the soul, the existence of God and the incarnation should be tolerated sooner than an argument to prove that the earth moves.

Galileo at last was again brought to bay by the church. He was imprisoned, threatened with torture, and finally forced to recant in the following language:

I, Galileo, being in my seventieth year, being a prisoner and on my knees, and before your eminences, having before my eyes the holy gospel, which I touch with my hands, abjure, curse and detest the error and heresy of the movement of the earth.

Campanella follows Galileo, defending him in his "Apology," for which, and other heresies religious and political, he seven times suffered torture. Kepler, the mathematician and genius thinking God's thoughts after him, in formulating the laws of planetary motion, takes up the thread dropped by Galileo. His works are condemned by the church, he is warned, abused, ridiculed and imprisoned.

The warfare of geology with Genesis is so recent in some of its aspects that many still recall it. Readers of the records of the rocks, now recognized as true promoters of science, were denounced as "infidels," "impugners of the sacred record," and "assailants of the volume of God;" while geology itself was declared to be "not a subject of lawful inquiry," but was denounced as a "dark art," "dangerous and disreputable," "a forbidden province," "infernal artillery," and an awful "evasion of the testimony of revelation." But a quarter of a century ago, a cultured American scholar, Alexander Winchell, was called to the chair of geology in an American university. Even his enemies admitted that his lectures were

"learned, attractive and stimulating;" he believed, however, that men lived before the date assigned to Adam, and that, in fact, not all men were descendants from Adam. For this heresy he was attacked in the paper of his church, was told by his bishop that "our people are of the opinion that such views are contrary to the plan of redemption," and was requested to resign. Refusing to do so unless some adequate cause were assigned, his chair was abolished within twenty-four hours, and the public were deceived with the falsehood that the reasons therefor were of an economic nature.

For unsoundness on this doctrine, for the belief now universal among scientific men that "there is a gradation extending upward from the lowest to the highest forms of created beings," and for other intellectual crimes, Vanini in the seventeenth century was sentenced to have his tongue torn out and to be burned alive.

Among the martyrs for truth should be mentioned opponents of the frightful witchcraft delusion. Syndic of Metz, seeking to protect a poor woman accused of witchcraft, was turned upon by her assailants, hunted like a stag from city to city and calumniated even after death. Loos, professor in the University of Treves, for mildly exposing some of the errors of witchcraft, had his book stopped in the press and his manuscript confiscated, while he himself was thrown into a dungeon. Later, tho forced to recant, he escaped death at the stake only by dying of the plague. Dietrich Flade, rector of the University of Treves and judge of the electoral court, in which capacity he had sent many a supposed witch to her death, at last became convinced of his error. For this crime he was accused of having sold himself to Satan, was put to the torture in the very chamber over which he had once presided, compelled to confess everything his torturers suggested, and finally strangled and burned.

For favoring the experimental method, whereby truth is sought by directly interrogating nature, rather than by deducing conclusions from isolated scripture texts, men have been outlawed and hounded as beasts of prey. Roger Bacon, whose services to science were hardly second to those of Sir Francis Bacon, offended by holding that man had not yet mastered the entire realm of truth, and that more might still be learned by the employment of rational methods. He explained the rainbow, he rejected the notion of satanic intervention in science, and even went so far as to perform experiments

in a laboratory. For these offenses he was branded as an "infidel" and an "atheist;" he was forbidden to lecture; "all men were solemnly warned not to listen to his teaching;" he was denounced as a "magician" and a "Mohammedan;" the authorities of his order, the Franciscan, solemnly condemned his teaching, their general threw him into prison, confining him for fourteen years, and he was finally released only at eighty when his advanced age had presumably destroyed his power to work mischief.

For possessing chemical appliances, John Barillon in the fourteenth century was imprisoned, and saved from death only by the greatest effort. For investigating the phenomena of light, as well as for theological heresy, Antonio de Dominis was subjected, in the fifteenth century, to judicial torture and murder. Lavoisier, not only "a great chemist but a true man," was sent to the scaffold by the Parisian mob, with the sneer that "the republic had no need of savants." For dangerous breadth and liberality of view the life of the sweet-souled Melancthon was embittered and his death bed tortured. For practising the experimental method as well as for believing in the unity of God, Priestly, one of the noblest of men and greatest of scholars, was set upon by a mob of ruffians who looted his library, waded knee deep among his manuscripts, burned his house and with it the literary labors of years, drove the philosopher into exile and would have murdered him had he not escaped their fury.

And thus the list of martyrs for truth might be indefinitely extended from the pages of the history of science. How like is this picture to that so vividly painted in the eleventh chapter of Hebrews:

And others were tortured, not accepting deliverance, that they might obtain a better resurrection:

And others had trial of cruel mockings and scourgings, yea, moreover of bonds and imprisonment:

They were stoned, they were sawn asunder, were tempted, were slain with the sword: they wandered about in sheepskins and goatskins; being destitute, afflicted, tormented;

(Of whom the world was not worthy); they wandered in deserts, and in mountains, and in dens and caves of the earth.

Yet all of these, the martyrs for religious faith and the martyrs for scientific truth, have sown the seed whose bounteous fruitage we to-day enjoy. They have levelled the mountains and filled the valleys. They have made the rough places plain and have cast up the highway upon which, as upon a Roman road built for eternity, we may

safely and swiftly travel toward that nobler civilization in which the seeking and finding of truth will no longer be a crime, and men instead of biting and devouring one another will work together as friends and brothers for the common good.

Far be it from me even to imply that those who turned thumb-screws, lighted fagots, and otherwise persecuted the seers, scientists, and saints of their day were themselves lost to virtue and in league with Satan. Many of them in so doing but followed their light. Unfortunately for them and the world they had not learned the great lesson that all our knowledge is but proximate and relative, that increasing light and added discoveries compel us to recast our beliefs and that therefore tolerance for views differing from our own, and willingness to compare our theories with those of others and to revise them in the light of fuller knowledge, is the only safe and rational attitude of mind.

I must speak, however, of the demand for leaders and heroes which is occasioned by the fact of social growth and progress. Familiar as is the fact, it is still difficult for us to realize that the world does move and that conditions and social relations change and must change if we are to escape the fixedness and death that mark the crystallized nations of the Orient. Society is an organism. As such it tends to grow. Forces, however, operate to resist this growth. One of the most potent of these has been called the "cake of custom," which, but slightly present in the beginnings of a society, gradually accumulates, thickens, and hardens, until, unless broken up by a supreme effort, it binds the society as with chains of steel, defying change and forbidding all movement save in the old-time grooves.

The formation of this crust is favored by human inertia—the tendency to follow the beaten track, the line of least resistance, as water flows down hill and follows the well-worn channels. It is favored by the imitative habit, the ape-like tendency to do as others do and obediently to follow the fashion of one's set, wear the clothes, pursue the occupation, vote the ticket, and repeat the formulas dictated by the leaders of fashion in these several respects. The fossilizing tendency is favored still further and most powerfully by the tightening of the bands of religious belief unenlightened by science, history and reason. Wherever it is possible to reënforce a custom by the dread sanctions of religion, that custom becomes rigid as the laws of the Medes and Persians, and binds society as the frosts of winter bind the streams.

Fixedness in a society is favored again by the development of social dependence. In the undeveloped society each is in a measure independent; he can coöperate with his fellows if he choose, or he can pursue his course alone. Are not the forests and streams as free to him as the wind that blows, the rain that falls and the stars that shine from heaven by night? With warfare, however, conditions change. The lands of the conquered are seized; common ownership of land gives place to private property in land, to be followed in time by a full-blown system of private property in the vast mass of the utilities and resources of life. Competition leads to the massing of this property in the hands of a minority of the society. The majority, cut off from access to the storehouse of nature and destitute of the means of subsistence, become dependent upon the propertied classes for the opportunity to exist. Serfdom begins, to be followed by wage service. No man may live without a master. One may stand all the day idle in the market-place because no one hath hired him. In such circumstances one's very life may come to depend upon his acceptability as a hireling. Departure, then, from the conventional, the orthodox and customary, becomes a source of peril to the propertyless. As the courtier cultivates the smile of his monarch, so the man without means must cultivate the good will and loving favor of those who may save his life by extending to him the privilege of laboring. Independence of manner, the exercise of private judgment, freedom of thought, freedom of utterance, free choice of candidates and policies at the ballot-box, are dangerous and may prove fatal. Starvation may prove the price of such liberty. In such circumstances, then, want and fear of want operate to crush out independence and individuality as surely as tho a monarch sat upon the throne and ruled the people thru a standing army. As gravity binds together the particles of the earth, so the forces of conventionalism hold men in the accustomed ruts and forbid the changes which growth and progress imperatively demand.

Here, then, as truly as when a society is menaced by a pestilence, a flood, or by an invading army, the leader and deliverer is needed. The slowly but surely forming crust, thickening and hardening about the society as the plaster employed by the inquisitor hardened about his victim, must be broken, or progress is doomed, and the fate which has overtaken the static societies of the Orient is for the occidental nation but a question of time. He who withstands the invading hosts of a hostile army may, it is true, risk his life. He

rests, however, in the calm consciousness that his people are with him, ready, from least to greatest, to pour out their last drop of blood and treasure in his support. But the foes of him who would save his society from stagnation and decay are those of his own household. Those whom he would save count him an enemy; and his fellow townsmen would dash him from the brow of the hill upon which their city is built, to rid themselves of one whom they esteem a pestilent fellow, a stirrer up of sedition, and a disturber of the social peace.

All honor to the military hero who amidst singing mauser, shrieking shell, and booming cannon, plies his task, tho comrades fall about him like grain before the sickle; all honor to him who, to defend his country's flag, endures hunger and privation, summer's heat and winter's cold, the hardships of the march, the dreary round of camp and bivouac and who faces death in a hundred forms; but greater honor is his due who, willing for the time to be misunderstood, braves the contumely and scorn of those whom he would serve, and dies daily for the cause which may not win until his ashes slumber in the churchyard. Of leaders such as these I must also speak.

The type of the moral hero and leader in the cause of social reform in America is Wendell Phillips. Born of the proudest blood of old New England, educated at Harvard College, blessed with affluence, by nature and art a peerless orator, enjoying every opportunity for promotion, and with the pathway to fame opening straight and smooth before him, Phillips, a generation ago, stepped upon the stage of action. But at this very moment a great cause cried out for a great leader. African slavery in America had reached its climax. Its reason for existence was gone. It smelled to heaven, and the cries of the bondman entered into the ears of the Lord of Sabaoth; but, as ever, polite, cultured, wealthy society heard not the cry. Slavery was one of the established institutions; it was respectable and must be let alone. The negro was private property and property was sacred. Moreover, he was probably not a human being; in any case he was low, gross and debased. Why should polite society even think of him? Further argued the clergy, slavery was a divine institution. The Israelites enslaved the Gibeonites, and Canaan was cursed. Paul exhorted servants to obey their masters, and returned the fugitive slave Onesimus to his owner.

Another preceded Phillips in the antislavery contest; one born not to ease and affluence and social position but to poverty and toil.

The cause of the slave had early won his ear, and the guns of the "Liberator" had already begun to shell the works of the enemy intrenched, apparently beyond all hopes of dislodging. Of this fearless man Lowell says:

In a small chamber, friendless and unseen,
Toiled o'er his types one poor unlearned young man;
The place was dark, unfurnished and mean;
Yet there the freedom of a race began.

It was Garrison, who had sworn eternal hostility to the sum of all villainies and had declared that this modern Carthage must be destroyed and immediately. On his statue in Commonwealth avenue in the Boston of to-day we may read his heroic words:

I am in earnest; I will not palliate; I will not excuse; I will not retreat a single inch; and I will be heard.

In 1835, Phillips, a young man of twenty-four, saw Garrison dragged thru the streets of Boston by a "broadcloth mob." Two years later another proslavery mob aimed a mortal blow at the liberty of the slave and at liberty of thought and speech; and Elijah Lovejoy's name was enrolled on the list of the martyrs for mankind. A meeting was held in Boston to protest against this crime. Treachery would have dealt another blow at the corpse of Lovejoy and the cause for which he died—but for Phillips. Mounting the stage, he swept aside the sophistries of apologists for slavery and crime, and sounded a bugle blast for freedom. From that time forward, Phillips was the foremost champion of the cause of emancipation. He paid the inevitable price. The abandonment of friends, the abuse of foes, the loss of social position, the sacrifice of ambition, threats, and at times imminent danger of personal violence—all these he experienced; but thru all, as one bearing a charmed life, he pressed his way, encouraging the downcast, cheering the faint, arousing the lethargic, goading on the time-serving politician to face and perform his duty, stilling the howling mob, scattering the fire which could never be quenched until the institution of chattel slavery was purged from the land.

And when the fires of eloquence and war had done their work, the shackles were stricken from the wrists of the negro slave, and his co-laborers proposed that the abolitionists now rest from their labors, Phillips rested not. None knew better than he that one reform but prepares the way for the next, that one victory renders easier an-

other, and that there is no discharge in the war for the liberation of humanity. Temperance, and the rights of women and of labor, financial and monetary reform of the most radical character, a just distribution of wealth—all these enlisted his sympathies, and their advocacy filled the remaining years of his busy and useful life.

Is the work to which such men as Garrison and Phillips gave their lives all done? Look around you and behold the fields white unto the harvest! Despite the progress that has been made in restricting the use of intoxicants the slaves of drink are still with us. The bleared eye and faltering step, the thickened utterance, the discolored countenance, still betray the presence and power of the cup. Crazed by alcohol the dutiful son, the loving husband, the tender father, becomes a fiend incarnate, trampling to death the mother who bore him, stabbing the wife of his bosom, braining the child for whom in his sober moments he would gladly have given his life. Of such Lucifers cast from the battlements of heaven to the depths of hell are, in a large measure, those who throng our police courts and fill our jails and penitentiaries, almshouses and insane asylums; and from these descend, disgraced and handicapped for life's race, multitudes with the inalienable right to be well born. Never, while this pestilence of drink walks in darkness and this destruction wastes at noonday need any one who loves his kind feel that there is lacking a task in which he may exhaust the utmost resources of his strength and still, like the Macedonian voice, cry for other helpers.

Intimately connected with the question of drink, sometimes in the relation to it of cause and effect, is the question of poverty. What is poverty? It is hunger, thirst, nakedness, degradation, shame. It is the lack of the chief material difference between man and beast. In the midst of our nineteenth century civilization it is the mark as of Cain upon the brow. Poverty is hell. It is the one state of torment men to-day really fear. To escape it they toil like galley slaves at the oar or like one slowly sucked into the bosom of the earth by a quicksand. To avoid its degradation and disgrace free-born citizens of the greatest republic of all time voluntarily, eagerly, sell themselves into slavery. The mirage of a competency still eluding them, they lie and cheat and kill, only too often to become at last a public charge and to be buried in the potter's field.

Terribly graphic are the lines of Mrs. Stetson:

There's a haunting horror near us
That nothing drives away —
Fierce, lamping eyes at nightfall,
A crouching shade by day;
There's a whining at the threshold,
There's a scratching at the floor —
To work! to work! in heaven's name!
The wolf is at the door!

* * * * *

To die like a man by lead or by steel
Is nothing that we should fear;
No human death would be worse to feel
Than the life that holds us here.
But this is a fear that no heart can face —
A fate no man can dare —
To be run to earth and die by the teeth
Of the gnawing monster there.

The slow, relentless, padding step
That never goes astray —
The rustle in the underbrush —
The shadow in the way —
The straining flight — the long pursuit —
The steady gain behind —
Death-wearied man and tireless brute
And the struggle wild and blind!

There's a hot breath at the keyhole
And a tearing as of teeth!
Well do I know the bloodshot eyes
And the dripping jaws beneath!
There's a whining at the threshold —
There's a scratching at the floor —
To work! to work! in heaven's name!
The wolf is at the door!

Socially viewed, poverty is a loathsome, chronic disease, poisoning every vein and artery of the body politic; it is a worm gnawing at the heart of our choicest fruit. It is barbarism prowling in the back alleys of our civilization, with gaunt and horrid face peering in upon us thru the blackness of the night and startling us at our feasts. Poverty is the horde of more hideous Huns and fiercer Vandals before which Columbia may yet fall. Let no one lull you to sleep with soft words of universal plenty, ease and comfort. Poverty, dire, widespread and terrible is still with us. Evidences of its

existence swarm, and no one can fail to see them without deliberately closing his eyes and persuading himself that the opulence of the rich implies plenty for all.

Poverty, tho a foul and widely prevalent disease, is nevertheless a curable one. Startling tho this proposition may be to the novice, it need not surprise the student of society. Were poverty universal, were the race as a whole still in the age of bronze or stone, struggling on a plane but little above that of the beasts of the field for a bare and wretched subsistence, poverty might be regarded as incurable. But not so. Steam and electricity and compressed air are being applied to machinery of incredible power and of almost human delicacy and skill; wealth beyond the dreams of avarice is pouring forth like a mighty tide. Not only so, but fallow fields and silent machinery and idle, willing arms are waiting and pleading to pour forth countless volumes more, but are prevented by human greed and industrial maladjustments, too familiar to the conscientious student. A chief and boldly avowed function of the trust is to *limit* production, to close mills and mines and factories, to hold natural resources out of use, and to discharge laborers, lest too much wealth be produced and prices and profits be thereby reduced. At the very time when, under the providence of God and by the skill and energy of men, we all might be rich and humanity might take a mighty forward and upward stride, the lords of land and capital forcibly restrain the people from producing the wherewithal to satisfy their needs, and thus perpetuate the poverty that rests like a pall upon the land. "Who," we are asked, "gave the earth to the profit makers" that they might coin the people's life blood into glittering gold? We, ourselves, by our wicked apathy, consent and connivance. We have weakly suffered our national heritage to pass from the hands of the people whose by right it is, into the control of the few, who daily, by failing to supply the people's needs or to permit them to supply them themselves, prove their incompetency to administer their great public trust. And thus, like Tantalus parching with thirst while his lips almost touch the limpid stream, we perish of want in a wilderness of plenty.

And over against this poverty is wealth untold; private fortunes beside which that of Croesus is contemptible; wealth daily and hourly augmented by golden streams flowing inward as the rivers of the continent run into the seas, and swollen by the toil of millions who live only to toil, and whose conception of heaven is a place of

rest. Accompanying this congestion is waste, extravagance, dissipation, effeminacy, the decay of morals, the loss of virility, and the steady sapping of character that comes from idleness and excess, and the consciousness of living the lives of selfish drones and building thrones and altars of pride upon the bodies of living men.

And what is this but the repetition of history? The concentration of wealth in a few avaricious hands, luxury, extravagance, pride, and the decay of virtue and manhood on the one hand, and widespread, gnawing, debasing, embruting poverty on the other, have in all previous times marked the decay of nations. "Great estates," wrote Pliny, "ruined Rome." And modern historians agree with him. Yet the concentration of American wealth in the hands of a few great trusts is sufficient to put to shame the *latifundia* which dragged down the greatest republic of ancient times.

Following the evils already named comes the decline of popular government, the sheet anchor of our political faith. With the development of social dependence, and the reliance of the multitude upon an insignificant minority for opportunity to work and thus to live, the substitution of minority rule for majority rule follows as a matter of course. Those who own, control. As their pliant tool and paymaster there now arises the political boss, the source of whose power the age has sought with such varying success to fathom. Thru this despot, drawing his inspiration and energy largely from aggregated capital, ignorant voters are duped, venal ones are purchased, dependent workingmen are terrorized, ambitious professional men are subsidized with hope of promotion, facile politicians are whipped into line tho every principle of their party be reversed, every promise made to the people broken, and every righteous sentiment outraged; legislation is made a matter of barter and sale; the judicial ermine is smirched, the fountains of learning are poisoned; and, thru its need for revenue, the house of God itself is at times made an accessory to the political machine whose end is to grind out greater privileges, enhanced power and ever vaster wealth for those who seek to reduce the nation to a mill for the extraction of profit from the sweat and blood of freemen.

No demand to-day for leaders and heroes! We live at the culmination of the ages. "The present is the product of all the past." The labors of the myriads who have preceded us, the inventive genius that has stolen the fires of heaven and consecrated them to the use of man, the discoveries that have wrested from nature her se-

crets and solved her sphinx riddles, the physical conquests more wonderful than an Arabian Nights' Tale, all have focused upon this age, to minister to man's material wants. The age-long evolution of popular rights and popular government has conspired to free us from the irresponsible rule of kings, oligarchs, and all tyrants whatsoever. The pioneers and martyrs of science have freely given their toil and blood, and have endured the living death of dungeons and the torture of the rack and fagot to beat back the darkness of ignorance, to break the chains of superstition, and to make of us freemen in mind. The martyrs of religion have been sold into slavery, thrown to wild beasts, and endured every cruelty that the imagination of demons could devise, to preserve for us a purer faith, and to establish in the earth the principles of kindness, forgiveness and universal fraternity—the principles for which Jesus lived and died. And shall we, the heirs of all the ages, possessed by right of a heritage soaked with the blood and watered with the tears of those who have bought it for us at so great a price, now basely surrender this goodly land and its unrivaled bounties to a petty band of freebooters, who under the forms of law made and interpreted by their creatures have, like a modern Genghis Khan or William the Norman, laid violent hands upon it and now demand of us all silent and willing obedience to their mandates? Like another Spartacus, we might exclaim, Is '76 dead? Is the old heroic spirit frozen in our veins? Are Patrick Henry, the immortal Declaration, Bunker Hill, and Lincoln's address at Gettysburg, all forgotten? Shall we cringe and cower beneath the lash of those who are seizing our fair domain, and lift no voice until the chains are riveted upon our wrists?

But the voice of craven prudence ever whispers in the ear: Is it safe? May we not bring upon ourselves the displeasure of the propertied? May we not lose caste among the respectable classes? May we not cut ourselves off from opportunity for promotion, or even from a chance to earn our bread?

May we not? Unquestionably we may. When was it ever safe or popular or respectable or remunerative to be a man, and to stand alone with God for truth and right and country? When, until the cause for which he fought was won, and the dogs that snapped at his heels and tore his flesh have turned to lick his feet, has one gained in a worldly sense by standing boldly for the right? Where do we read that A, by opposing the doctrine of the divine right of kings, attained immediately to great popularity and was chosen prime min-

ister? Or that B, by challenging the dogma of papal infallibility, was at once proclaimed the leading theologian of his age and sent a cardinal's hat? Or that C, by demonstrating that all the scientists had been wrong in holding to the doctrine of special creation, when in fact species came by evolution, was promptly elected a member of the French academy and honored by all the scientific societies of Europe and America. Or that D, on demonstrating that corporations shamelessly evade taxation and plunder the public thru the device of stock watering, was officially proclaimed a foremost authority on the lines of his investigations, and unanimously elected president of the greatest railway system in America, at a salary exceeding that of the president of the United States? Heroism is not a business to be entered for reward, save that which comes from a good conscience and a sense of duty done.

But why, I am asked, should one forego the delights and blessings of life, and choose the path strewn with stones and briars? For the same reason, I answer, for which men in all ages have braved the hardships and perils of war in their country's behalf: the reason, simply, that the public good demands it; and the public good rises in importance above all questions of mere individual comfort and convenience. When a nation's weal is menaced there's no time to think of men. Next to our duty to God is our duty to our country.

Upon students in an institution such as this the obligation of personal sacrifice for the common weal is greater even than upon most men. Our College is supported at public expense, by the people not only of the whole state, but of the nation. Every effort is put forth to make possible a college education at the minimum cost to every applicant. Why should the people of Kansas and of America give of their hard-earned wealth to provide you with a free education? There is but one reply—that you may worthily serve the state and nation and render back a service for the advantages you have enjoyed. As you have freely received you must freely give. Do you inquire how great is that debt? I answer, it cannot be estimated. All the difference between ignorance and scholarship, undeveloped and well-developed faculties, a narrow and an enlarged horizon, meager influence and great in your community; all the difference between failure and success in your chosen vocation; all the difference between a low-pitched and impoverished life and a career of honor and usefulness you may owe to your College, and behind it to your

country, which has made such an education possible for you. How gladly then will the conscientious student when once his path of duty is made plain respond to the call of his state and country, and yield to both the highest service of which he is capable, however much that service may cost him in toil, privation, and pain!

But not only does the voice of social duty and patriotism call aloud to each to devote his best talent and service to the common good; the voice of religion is even more imperious. In all the great religions, and notably in the Christian, the principle of sacrifice is fundamental. Tho perverted in less enlightened times to foolish and cruel ends, it still sounds the dominant note of Christian faith. Thru the long ages of Jewish history preceding Christ, the blood of bulls and goats, the ashes of heifers, sheep and doves, but served as an object lesson pointing to the higher sacrifices that must follow increased light. These better offerings are fully set forth in the New Testament Scriptures. We are urged to give our bodies as living sacrifices to God. The apostle to the Gentiles pathetically enumerates his own sacrifices for the Christian faith: labors, stripes, imprisonment, stoning, shipwreck, journeyings, perils of waters, of robbers, of countrymen, of heathen, perils in city, in wilderness, on sea and land, among false brethren, in weariness and painfulness, in watchings, hunger and thirst, in fastings, cold and nakedness—the whole to be crowned by the martyr's death. Everywhere it is set down that the broad way of popularity and pleasure and ease and self-gratification is the downward way, while the way of life is narrow and thorny. The symbol of the Christian religion is the cross, the type of a shameful and hideous death. Those who would have life are told to forsake all, take up the cross and follow the Master, and they are assured in advance that all who will live godly shall suffer persecution. To those of you who have named the name of Christ let me say, that whoever may choose the bed of roses and the path that leads to ease and pleasure, such a lot is not for you. On every church wall you are reminded that without the cross there is no crown; and the pages of sacred history from the days of Jesus until to-day point you, as models of the Christian life, not to those whom the world calls happy, but to those who, like their great Leader, have trodden the wine-press alone, borne the sins of many, wept with the sorrowful, shared with their brethren the cup of bitterness, bared their shoulders to the lash, toiled, suffered, endured, esteeming themselves worthy of no happier or lighter lot than

that of the Man of Sorrows, and awaiting their reward in the future life. Then why should we who chance to live at a later day assume that the sacrifices have all been performed and that nothing remains to us but selfish enjoyment of the blessings others have bought? Let us not deceive ourselves. The narrow path, strewn with shards and brambles, lies straight before us, and the pierced hand beckons the way. But our sacrifices mean not the burning of beasts, the wearing of haircloth next to the skin, burying our lives in the ancho-rite's cell, and wasting our strength in vigils and and fastings. The place for the Christian of to-day is on the crowded street, in the legislative hall, in shop and factory, on farm and ranch, wherever men are needed; and everywhere, unless prepared to crucify afresh Him whose name he bears, his stand must be taken with the few who despise ease and safety, promotion and fame, lift up their voices against social sins, and labor to realize here and now, in education, legislation, business, on stock exchange, in factory, mine, government bureau, and private corporation, the ideal set forth by Jesus Christ. He who thinks of his religion as primarily a matter of Bible reading and church going, and who shrinks from carrying it from the individual to the social plane, and giving his strength and if need be his life to the Christianization of our modern industrial and social system, cannot be the disciple of Him who purged the temple and opposed, not the sins of the antediluvians, but the state of things in which he found himself and the hypocrisy of those who upheld it in the name of religion. For what is religion but the power that binds us to God and to each other? And what is Christianity but that form of religion that emphasizes the doctrine of brotherhood and of unity under the law of love? But while love does not prevail and our society is rent by wars and conflicts and we compete the one against the other and seek our own rather than our brother's good, how can we rest, thus infinitely removed from the ideal up-raised by Jesus Christ? Should we not frankly confess that we are not Christians? And should we not penitently seek such a baptism of power and of love as will lead us to abhor our backslidings and consecrate ourselves anew to the service of God and of our fellow men? And when thus touched with divine fire, what power can restrain us from expressing our passion in strivings for the common good and the redemption of our society from those evils that negative every principle of Christ's religion and bind men in the chains of animalism! Can contumely and scorn and misrepresentation and abuse

turn us back from the service of God in the redemption of our brethren to the service of self and the quest of mere material gain and sensual pleasure? If so, better were it for us never to have been enlightened and to have tasted the heavenly gift and the powers of the world to come. The most unqualified teachings of Jesus were his condemnations of individual wealth. With Him it were easier for a camel to go thru the eye of a needle than for a rich man to enter heaven. And the rich young man who would be perfect was commanded to sell all he had and give to the poor. Genuine religious zeal manifests itself uniformly in longings and strivings for the realization of economic brotherhood and equality of opportunity.

The early Christians at Jerusalem but obeyed the common instinct of Christians when they established a community of goods. Their example was widely followed. Down thru the first twelve centuries the Christian fathers, Tertullian, Chrysostom, Ambrose, Augustine, and the rest denounced private property as a deadly sin and advocated communism as an essential corollary of Christian doctrine; while we now know that the relentless persecutions of the Christians were due far more to their economic views and practises than to their theological beliefs. While communistic societies to-day are probably impracticable save as object lessons, and while it were vain to abandon our businesses and scatter our substance among city slums we must realize that our present system of industrial warfare and private property in social utilities is not and cannot be Christian, and that in no way can we deliver our souls but by devoting our lives to transforming our institutions to accord with the Sermon on the Mount.

A mighty conflict awaits us. The strife of light with darkness, of Gog with Magog, of good with evil, is again taking concrete form. Cowards will shrink and consult their personal safety and comfort, false witnesses and dastards will deceive, those having itching ears will heap to themselves false teachers who will call evil good and good evil, Judas will again betray his Master with a kiss, modern scribes and pharisees will rouse the ignorant and fickle multitude to cry, "Crucify him! Crucify him!" and again men's hearts will fail them and they will wonder whether indeed God has forgotten, and his cause is lost. But hark! A voice cries:

To your tents, O Israel! Who is on the Lord's side? Choose ye this day whom ye will serve! If the Lord be God, serve Him; and if Baal, serve him!

And I see a dividing of the hosts. From the ranks of all social

groups and political parties and churches and temperance societies and charitable bodies and young people's religious organizations and college classes and families there are coming a multitude to array themselves under the standard of wealth and social privilege and class rule and inequality; but, led by those who have risked and suffered all things that the race may take its next forward step, another company, small to-day but destined far to outnumber the first, are taking their places under the white banner of brotherhood, purity, social justice, equal rights and equal opportunity to live and love and be men. And among these last will be many now before me, scorning danger and hate and striking valiant blows for God and country and the common good. To you let me say, only be strong and of good courage. Those that will be for you are more than those that can be against you. Tho the enemy appear mighty and terrible, the Lord will deliver them into your hand and the land which he swore unto your fathers will yet be yours.



"HOW OLD ARE YOU?"

BY D. H. OTIS.

NOT in years, months and days, for life does not consist entirely of these, but how old are you when measured by the thoughts you think, by the noble deeds performed and by the inspiration and encouragement given to others by your manly, cheerful, upright, courageous and industrious life. Washington and Lincoln have lived and will continue to live in the hearts of the American people as long as this republic shall last. Why? Not because they lived to a ripe old age, but because in an hour of opportunity, when the nation was in peril, they were equal to the emergency and acted with precision and judgment. Dewey and his colleagues accomplished more for civilization in one day than the Spanish nation has done for centuries. Just so with individuals in every walk of life. One man may live, not exist, longer in a single day than others will in weeks, months, and even years. Think of an Edison or a Gladstone and we are immediately impressed with the thought that life consists not of years but of noble deeds performed.

On the 29th of last January, Kansas celebrated her birthday anniversary as a state. To say that she is thirty-eight years old would

not mean much were it not for the fact that in that time she has made wonderful advancements. In many respects Kansas stands as the foremost state in the Union. Her large annual productions of wheat and corn go to feed many a hungry mouth in the East. Kansas has the largest apple orchard in the world. She can exhibit beef animals that are on a par with those of any state. Altho an infant along dairy lines, she nevertheless has dairymen who have realized over \$81 per cow per annum. Kansas is exceptionally blessed with good public schools and colleges. Her University and Normal School rank among the best in the country, while her Agricultural College is acknowledged to be the best of its kind in the world. These and many other features demonstrate beyond a doubt that the age of Kansas is measured, not alone by years, but by the character of her institutions and by the degree of her advancement.

Altho Kansas has much to be proud of she must not forget that there is great room for improvement. It is not necessary for her to grow old in years before she reaches her fulness of stature; that depends, not so much on the number of years as upon the thoughts she thinks, upon the achievements accomplished and the foundation laid for her future happiness and prosperity. There is no reason why Kansas should not push right to the front, and when the question is asked of her, "How old are you?" let the answer be made by pointing not to her years but to her works.

In order to accomplish the above, her citizens must become educated. Education is no more a luxury, but a necessity. It is an admitted fact, that a trained mind can accomplish much more, do it easier and do it better than an untrained mind. For this reason Kansas schools should receive every possible encouragement. Kansas is preëminently an agricultural state, and no part of her educational system should receive greater attention than that along agricultural lines. The farmers of Kansas, as well as the young men who are to become her future farmers, are hungry for information along these lines. This is partly shown by the demand for help to hold farmers' institutes in various parts of the state, which demand the Agricultural College has been only partially able to meet. The legislature of 1899, appreciating the needs of the farmers, very wisely appropriated \$2000 annually for the next two years for the purpose of holding farmers' institutes in various parts of the state. It also recognized the important and growing industry of dairying by appropriating \$34,000 for the establishment of a dairy school. In

the past, many of the young men of Kansas who have been trying to perfect themselves along the line of dairying have asked the College for bread and have received a stone, simply for the reason that there were no facilities for giving instruction in their chosen profession. Even those who tried to make the most of the opportunities offered in the past two years found themselves hampered and treading upon each other's toes by the crowded, unhandy and unsuitable quarters in which they were obliged to work. With a dairy building and an increase in the college herd, Kansas boys can now have dairying to their hearts' content right here at home; and not only that, but the results in breeding, feeding and care of dairy cows will be published as bulletins or press notices for the benefit of the farmers who, for various reasons, may be unable to attend the dairy school. The Mechanical department has also received a much-needed addition in the way of buildings and equipment, and will be able to handle to much better advantage the numerous students interested in mechanical lines. A small addition in equipment has likewise been allowed for horticulture, veterinary science, chemistry and physics. This enlargement of opportunities, taken in connection with the work that will be done along the line of feeding and plant breeding, will enable the agricultural students to receive thoro instruction on subjects that are of vital importance to the progressive farmer.

Along the line of agricultural education the question may very properly be asked of the young men and women of Kansas, "How old are you?" Will the answer imply that the growth has been stunted because of unimproved opportunities? With the lower animals the system requires a certain amount of feed to keep up repairs; and the profit in the form of work, beef or milk comes from the feed consumed over and above that needed by the animal system. Will the youth of the state of Kansas give their minds just enough intellectual food to keep them alive, or will the supply be more than is needed for actual existence so that work may be turned out at a profit, and, above all, characters developed that are thoroly equipped to meet the problems of life?

How old are you? Let the answer ring out in tones clear and strong so that the world may hear, that life does not consist of years only, but of living personalities, trained in the minutest details for life duties.

NOTES ON REFRIGERATING MACHINERY.

BY JOS. D. HARPER.

IN the present article no effort has been made to set forth the technical and scientific aspects of refrigeration. On the contrary, the aim has been to present some elementary features of the subject in the most simple manner. With this idea in view, we may describe mechanical refrigeration as the process of reducing the temperature of a body, or of keeping that temperature below the temperature of the surrounding atmosphere. This may be effected in various ways; but, on a commercial scale, only one is in use, i. e., the evaporation of liquids which have a low boiling point. Various liquids are used, such as anhydrous ammonia, liquid carbonic acid, liquid sulphurous acid, ether, Pictet's fluid, etc.; and the amount of cold that can be produced by any one of these is represented by its latent heat of evaporation. Ammonia is most commonly used as the working substance, since it has no active chemical properties, can be liquefied at comparatively low pressure and high temperature, and has a high latent heat of evaporation. The ammoniac machines alone will be here considered. They are divided broadly into two types known as the Compression System and the Absorption System.

COMPRESSION SYSTEM.

In the compression system the working substance or charge is in the anhydrous form, such as liquefied ammonia gas. The operations are continuous and form a complete cycle, the working substance returning periodically to its original state. Liquid anhydrous ammonia evaporates to a gas or vapor in coils of pipe called the expansion or refrigerating coils. The heat necessary for this expansion is absorbed from the air of the room to be cooled, or from the salt brine in which the coils may be submerged.

Leaving the coils, the expanded vapor enters the compression pump, or compressor, where it is reduced to a dense vapor and forced into a second series of coils called the condenser. These condensing coils are cooled by running water, which removes the heat absorbed in expansion and also that acquired in compression. Under the combined pressure and cooling, the ammonia condenses to a liquid and passes down to a small receiver. Here it is once more liquefied anhydrous ammonia and enters the expansion coils thru a regulating valve to repeat the cycle. The process then consists (1) in the ab-

sorption of heat by the ammonia in the expansion coils and (2) in the removal of this same heat from the ammonia in the condensing coils, the removal being effected by running water surrounding the latter.

COMPRESSORS.

The compressor is generally worked by a slow-speed steam engine, tho any source of power may be utilized to drive the compressing pump. The compression cylinders may be either single or double acting, and one or more in number. Double-acting cylinders require long and heavy packing around the piston rod in order to resist the pressure and action of the hot ammonia vapor. All parts of *any* ammonia system must be of iron or steel, as copper, brass or bronze cannot be used in contact with ammonia.

Machines are rated either by their refrigerating capacity or by their ice-making capacity; the latter usually being taken as one-half the former. A refrigerating capacity of one ton per 24 hours means that the machine will produce a cooling effect equal to that of one ton of ice at 32° F., melting to water at 32° F. The actual ice-making capacity of this same machine, however, will be about one-half ton per 24 hours.

The capacity of a compressor depends not only on its cubic capacity and speed, but also on the prevailing working conditions, *especially* on the temperature of the condenser and the expansion coils. Under ordinary conditions a compressor capacity of 4 cubic feet per minute may be taken as equivalent to a refrigerating capacity of one ton per 24 hours.

Construction details of compressor cylinders are similar to those of steam cylinders, special attention being given to low speed and small clearance. Each acting end of the cylinder has two valves, one for the admission of the vapor and one for its escape to the condenser. The amount of compression is regulated by a spring or by weights on the escape valve, the usual compression being from 150 lb to 170 lb per square inch. The ammonia in the refrigerating coils cannot be expanded to a pressure lower than that necessary to lift the admission valve.

The lubrication of the compression cylinders is a rather difficult problem, for the oil is not distributed over the entire interior surface as is the case with steam cylinders. Experience shows that it is almost impossible to keep a horizontal compressor from running dry on top; and, for this reason the best modern practise favors the

vertical type of compressor. Lubrication of the cylinders, tho necessary, leads also to serious annoyance and loss of efficiency, as the oil is carried over by the ammonia to the condensing and expansion coils where it collects at the returns, and clogs the machine. Oil traps and numerous devices between the compressor and the condenser are in use but are not entirely satisfactory. The best machines have arrangements for reversing the direction of the ammonia, thus emptying the condensing coils, after which the oil is blown out by steam. A further objection to this lubricating oil is advanced by some who claim that while ammonia vapor is not combustible nor a supporter of combustion, yet when this hot vapor is charged with oil it becomes a combustible and explosive mixture. Some recent accidents seem to support this contention.

During compression a certain amount of heat is evolved and must be removed in order to keep the vapor in a saturated condition in the compressor. The different methods taken by the various manufacturers to counteract superheating have given rise to the various types of machines known as dry compressors, wet compressors, water-jacket compressors, oil-seal compressors, etc.

Wet compressors, such as the Linde, are those in which a surplus of anhydrous ammonia enters the expansion coils and passes unchanged to the compressor. There, by its evaporation, it takes up the heat of compression and maintains the vapor in a saturated condition. The pipe leading from expansion coils to a wet compressor should, of course, be carefully insulated to prevent the evaporation of this surplus ammonia *before* it reaches the compressor. This precaution is often neglected and a frosted pipe results—a condition known technically as “freezing back.”

Dry compressors work without excess ammonia, and superheating is prevented in various ways. Some have single-acting cylinders in which the gas has free access under the piston head, thus cooling the cylinder and piston. One prominent machine has vertical compressors in which refrigerated oil is circulated by a small pump, thus removing the heat of compression and lubricating the cylinder at the same time. Enough oil may be used to fill the clearance space, whence arises the term “oil-seal compressors.” Water jackets thru which cold water or brine circulates are also used to counteract superheating.

CONDENSERS.

The condenser consists of a system of pipes forming a coil into which compressed ammonia vapor is forced by the compressor.

These pipes are either immersed in a tank thru which cooling water circulates, or are hung up in the open air and have cooling water trickling over them from a perforated gutter above the top pipe. The former arrangement is called a submerged condenser and the latter an open-air condenser.

In passing thru the condenser the ammonia vapor gives up to the cooling water the heat absorbed in the refrigerating coils, and condenses to liquid anhydrous ammonia as previously stated. Condensers are usually built of 1½-inch to 2-inch pipe, divided into sections. These sections are connected at both ends to common manifolds in such a way that one or more may be disconnected for repairs or cleaning without stopping the machine.

In a submerged condenser the hot vapor enters the coils at the top and the liquid ammonia leaves at the bottom. The cooling water should enter the tank at the bottom and pass out at the top. In the open-air style the cooling water drips over the pipes from the top and the ammonia enters at the bottom. A vertical manifold at the side collects the liquefied ammonia as fast as condensed. As the efficiency of the condenser is a large factor in the economic operation of a machine, a generous condenser surface should be provided.

The necessary piping for condensing and expansion coils can easily be calculated theoretically, as, in fact, can all other dimensions of refrigerating machinery. The working conditions, such as insulation, temperature of water, etc., modify these results so largely, however, that empirical rules based on experience are generally more satisfactory. Practise indicates that, for incoming cooling water at 75° F., which may be taken as an average working condition, 40 square feet of condenser surface should be provided for each ton of refrigerating capacity per 24 hours.

The amount of cooling water varies with the temperature, and is ordinarily from 4 to 7 gallons per minute for each ton actual ice-making capacity per 24 hours. Open-air condensers require much less water than the submerged type; in many instances not more than one-half. This is due to the fact that *all* the water comes in contact with the surface to be cooled, and especially to the cooling of the water by its own evaporation as it trickles over the pipes. All condensers should be built high and narrow rather than broad and low.

EXPANSION COILS.

The expansion coils are built up from pipe varying in size from 1 inch to 2 inches according to circumstances. The surface of the coil

is proportional both to the cubic capacity of the room or tank to be refrigerated and to the temperature to be maintained. The quality of the insulation is such a large factor, that experience is the best guide. Roughly, the piping may be estimated from the following: For brine tanks of ice-making plants 250 to 300 running feet of 1½-inch pipe should be allowed for each ton of ice to be manufactured per 24 hours; one-half this amount for each ton refrigerating capacity.

For a refrigerating room either of two systems may be used: (1) Direct expansion, in which the ammonia expands directly in coils placed in the room to be chilled; or (2) the brine circulation, in which the ammonia expands in coils in a brine tank—the cold brine being then pumped thru coils placed in the rooms.

Liberal assumptions give the following rules for piping for direct expansion: (1) one running foot of 2-inch pipe for each 10 cubic feet of space in rooms to be kept at 10° to 20° F.; (2) one running foot of 2-inch pipe for each 20 cubic feet of space in rooms to be kept at 32° F.; (3) one running foot of 2-inch pipe for each 60 cubic feet of space in rooms to be kept at 50° F.; or (4) it is often assumed that 300 feet of 1½-inch pipe will distribute one ton of refrigerating capacity and maintain 4500 cubic feet of cold storage capacity at 32° to 35° F.

Brine circulation requires 1.5 to 2 times as much piping as direct expansion. This is due to the higher temperature of the brine and its slower circulation. Lower temperatures can be maintained by the direct expansion which in many ways is superior to brine circulation for refrigerating purposes. The latter, however, permits the stopping of the plant for several hours, as for repairs, while the brine pump continues in operation—the large brine tank acting as a storage reservoir of cold.

All coils in cold-storage rooms should be built in sections connected to common manifolds and arranged for the thawing off of the collected frost which impairs the absorption of heat.

ABSORPTION SYSTEM.

In the absorption system, the condenser, expansion or refrigerating coils, and general details are the same as for the compression system. The operations taking place in this part of the machinery are also the same. The difference lies in the nature of the charge and in the operations taking place after the ammonia leaves the expansion coils and before it reaches the condenser. The charge is

strong aqua ammonia, usually 28° to 30° B., and the series of operations forms a continuous compound cycle.

The aqua ammonia is heated in a still or generator and ammonia gas driven off at a pressure of from 120 lb to 180 lb per square inch. Passing out of the top of the generator to the condenser, this ammonia vapor condenses, under the pressure and cooling, to liquid anhydrous ammonia. Entering the expansion or refrigerating coils, it performs the required work precisely as in the compression system; and leaving these coils, it enters the absorber. Meanwhile, the weak ammonia liquor, from which the ammonia gas has been given off, is forced out at the bottom of the generator by the pressure of the gas above. This weak liquor passes thru a series of pipes called the exchanger, then thru a cooling coil, and finally enters the absorber. Here the weak liquor reabsorbs the ammonia vapor entering from the expansion coils and becomes again strong aqua ammonia. This strong liquor is pumped from the bottom of the absorber by a small ammonia pump to the top of the generator, passing thru the exchanger on its way. Having reached the generator, the gas is again driven off and the cycle repeated.

GENERATORS.

Stills or generators are built in a variety of shapes, the main object being to drive off as much of the gas as possible and have it free from water vapor. The heating is always done by steam coils within the generator. The most efficient generators are those arranged for successive distillations. The aqua ammonia flows thru large horizontal pipes or fingers each containing a steam coil, and is repeatedly distilled, leaving a very weak liquor to escape from the last or lower finger. Usually a standpipe containing a coil is added. The incoming strong liquor circulates thru this coil before reaching the horizontal fingers and is heated by the hot ammonia gas passing up the standpipe on its way to the condenser. Also, this coil serves to dry the gas as the suspended watery vapor is deposited on the surface of the coil. The overflow connection from one horizontal finger to the next is arranged at such level as to keep the steam coils always covered by the aqua ammonia.

The pressure of the ammonia gas in the generator is called the high pressure and is usually from 120 lb to 170 lb per square inch, varying with the temperature of the generator and the amount and temperature of the cooling water.

ABSORBERS.

Absorbers are of infinite variety and are of prime importance to the efficiency of this system. The heat evolved by the absorption of the ammonia vapor must be removed by the cooling water, since the amount of ammonia gas that can be absorbed by the weak liquor rapidly decreases with a rise in temperature. One very efficient absorber is built like an upright boiler, open on top and having a great number of straight tubes thru which the cooling water passes. An automatic valve regulating the quantity of weak liquor admitted to the absorber is a valuable feature of this same make.

The pressure of the ammonia vapor within the absorber is known technically as the "back pressure;" and, for economic operation, should not exceed 8 lb to 12 lb per square inch. The lower the back pressure the better, as the maximum amount of work will be done in the expansion coils when the anhydrous ammonia expands to as low a pressure as possible. It is a noticeable fact that many of the earlier builders of absorption machines failed to appreciate this feature and built machines to work with a high back pressure: probably because increased pressure increases the amount of gas that will be absorbed at a given temperature. Modern practise is in the direction of increased absorber capacity and greater area of contact for the gas and liquor, thus holding the back pressure down as low as possible. The back pressure also varies with the temperature and amount of cooling water and the temperature of the expansion coils.

AMMONIA PUMP.

The ammonia pump is the only moving part in the absorption system and is a small affair running at slow speed. The size of the pump cylinder and the speed depend not only on the size of the plant but also on the strength of the strong and weak liquors. Under average working conditions—i. e., strong liquor 30° B., weak liquor 14° B.—a plant of ten tons actual ice-making capacity per 24 hours requires a double-acting pump cylinder 3 inches in diameter and 8-inch stroke, making about 25 strokes per minute. The packing around the piston rod must be extra long and heavy as the liquor is pumped against the high pressure in the generator. The pump should always be lower than the bottom of the absorber to prevent any lifting effect on the strong liquor.

EXCHANGER.

The exchanger or equalizer is a device to save the heat carried away from the still by the weak liquor by imparting this same heat

to the rich liquor on its way to the still. It consists merely of a coil of double pipes, one within the other. The hot, weak liquor passes thru one pipe and transfers its heat to the cool, rich liquor passing thru the other pipe in the opposite direction.

WEAK LIQUOR TANK.

The weak liquor, before entering the absorber, is usually further cooled by passing thru a submerged coil. The water used to chill this coil is commonly the same that has been used to cool the absorber.

For both systems *all* parts should be of the very best material and extra heavy.

Probably more compression machines are in operation in this country than absorption machines, but an investigation some years ago indicated that for the manufacture of artificial ice, eighty per cent of the plants used the absorption system. Distilled water *must* be used in the cans if a clear, marketable product is desired. In the absorption system the steam from the heating coils of the generator is condensed to furnish this distilled water. In the compression system, economy requires the use of the exhaust steam from the cylinders of the compressor engine. The lubricating oil must be removed from this exhaust steam by the so-called oil traps, and as yet an entirely satisfactory and inexpensive method of *actually* removing the lubricating oil has not been devised.

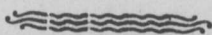
The plate system of ice making, however, does not require the use of distilled water, and for large plants seems fairly successful.

The application of mechanical refrigeration to ice making, cold storage, etc., is so simple that a description of the methods is omitted from this sketch.

A comparison of the two systems, compression and absorption, is difficult, as local conditions and the nature of the work largely determine which style of plant should be used. Where cooling water is expensive or becomes *very* warm during the summer months, the compression system is probably better. The amount of compression given to the ammonia vapor can be increased to suit the conditions. For ice making purposes, the absorption system seems to be generally preferred. Often the absorption system is installed under adverse conditions by arranging to chill the cooling water before use. This is cheaply done by allowing it to trickle over rods or shallow trays exposed to a draught of air. Where water is very expensive

it may be used repeatedly by adopting suitable cooling devices. The compression system is more imposing in appearance but usually requires the close attention of skilled attendants. In technical journals devoted to refrigeration interests, about four-fifths of the space is given to the troubles of the compression system and the remedies therefor. The operating cost of large plants under first-class management is practically the same for both systems.

Machines using other substances than ammonia for the working medium are numerous, especially in Europe, and present many interesting features. Their general construction, however, and plan of operation does not vary materially from that of the ammonia machines.



GLIMPSES OF THE FUTURE.

A LECTURE BY FRANK PARSONS.

IN the course arranged by the students' societies, De Witt Miller was to lecture at the College, on June 5. Owing apparently to an error of the lecture bureau thru which the student committee engaged Mr. Miller, he was unable to reach Manhattan in time. A telegram to that effect was received by the students on the morning of the 5th. They asked Professor Parsons to fill the vacancy, and he assented. In the evening, Mr. Kinsley, on behalf of the student committee, stated the facts in the case and introduced Professor Parsons, who spoke in substance as follows.*

LADIES AND GENTLEMEN: You have my deepest sympathy, for you are to miss the pleasure of hearing Mr. Miller, and I think you will agree with me that I deserve your sympathy in my efforts to fill the hour that belongs to him—a difficult task at any time and especially difficult on such short notice.

A famous lecturer used to have printed on his tickets something like this:

Admit one to lecture at such a date and place. If the lecturer should die or be hung before the said date, this ticket will admit the bearer to a front seat at the funeral, where he can sit and enjoy himself the same as at the lecture.

I do not mean to intimate that Mr. Miller has departed this life, via the hempen string or otherwise, but only that you may try to en-

* The report has been revised by the lecturer, some points omitted and others developed a little.

joy yourselves even if you should regard these services as the obsequies of your hopes of hearing Mr. Miller's lecture.

Let us talk a little while about some possibilities of the future. To understand the future we must understand the past.' Astronomers note where the planet was three months ago, two months ago, one month ago, to-day—draw the curve thru these points, and prolong it according to the same law of movement, and we know where the planet will be to-morrow, next week, next month, etc. It is the same with the movement of events in history.

Look at the growth of power in this country—thirty-fold since 1820, over four-fold per head in three-fourths of a century (not including water power)—the equivalent of six men working for each inhabitant. We have conquered the steam and the lightning. We compel Niagara to do our work. Soon we shall harness the ocean and the sunbeam. Tesla is trying to store the sun's light and heat. When we succeed in doing that we can warm our towns and cities in winter with the heat we store in summer. We may even banish the winter and make the climate what we will. Then there is liquid air, a new and powerful motive force, the possibilities of which are just beginning to be seen. It supplies in very small bulk a source of enormous power.

A hundred years ago it took 18 days to go from Boston to Philadelphia and back again; now it can be done in a day. Steam and electricity carry us like the wind. We have already found means of moving at the rate of 150 to 200 miles an hour. In the coming years those means will be used. With liquid air our ships can cross the sea without the weight and expense of carrying coal. Submarine boats will go long distances under the sea with liquid-air motors; and, instead of the noxious gases produced by present motors, the crew will enjoy an abundant supply of the purest air from the same source that yields the motive power. We have our bicycles with which we can travel faster and farther than a horse; and soon we shall have our liquid air motor under the seat, and can put our feet on the rests, if we choose, and go spinning over hill and dale by the power of condensed atmosphere. Automobiles, too, are coming into use. They are costly now, but they'll be cheap in a little while, and every respectable family will have its automobile. There are many in use in Europe now. Dukes and duchesses travel all over France in them, moving at the rate of 50 or 60 miles an hour.

We shall have splendid, broad, smooth roads from one end of the

country to the other and in every direction across it. The bicyclists and automobilists will see to that—and a family will take a lunch basket and some extra clothes and climb into their automobile, and go off for a spin thru Yosemite, or take a trip to Chicago or New York and back with almost no expense, for the automobile doesn't eat oats. But that isn't all. If I live a few years I expect to fly. We know how to fly some now, but the air ship is waiting for a light and powerful motor. Take your little cylinder of liquid air at 312° below zero, and make a little papier-maché engine and you have the last thing needed to make the air ship a success. I can imagine a gentleman saying:

John, get the air ship ready, please. We'll take a trip to the Philippines in the morning and visit Dewey before breakfast.

Even the air ship may not exhaust the list. I'm not sure but we may have pneumatic tubes, someday, thru which we can fire a man a thousand miles an hour.

We can send our thought a thousand miles in an instant. A man in St. Louis can talk with one in Boston over the telephone. Soon we shall be able to see the face of the distant friend while we talk with him. We are learning to telegraph and telephone without wires. It is not impossible that thought may be communicated directly from mind to mind. The Hindoo magician can put an empty cocoanut-shell on a stick, hold it out at arm's length, and pour bucketfuls of water from it. He can withdraw the stick and leave the cocoanut at rest in midair without support. He can plant a mango and have a 50-foot tree grow above it in five minutes' time. He can throw a rope into the air, have it remain vertical and rigid above him while he climbs up it, hand over hand, till he disappears in the blue. That is, he can make a group of bystanders believe that they see these things, and the explanation is that the Hindoo magician understands telepathy—he is able to transfer to other minds any series of images he chooses to pass thru his own consciousness, and the transfer has such vividness and intensity that were it not for the camera, which cannot see the tree or the rigid rope, and for nineteenth century science, which knows the laws of growth and gravity, the onlooker might almost be convinced of the actual occurrence of the phenomena he seems to see. If our scientists will study this telepathy as they have studied steam and electricity, we may yet be able to communicate with our friends around the world without words, without expense, and without the waste of a moment.

We have learned how to fix the forms and colors of nature and even movements can be reproduced by a series of pictures. We can register the words and tones of actors, orators and singers. Who knows but we may soon be able to fix and preserve each passing phase of thought. The X-rays penetrate the body and make it transparent. An electric bulb swallowed by a fish lights up its vitals and enables us to see every fiber of its being. The nerve-aure of hypnotized subjects will go thru solid stone walls, and carry sensations thru brick and mortar. Maybe to-night, on some far planet, beings superior to us in knowledge and power are gazing thru their telescopes upon the earth. What do they see? A speck of dust floating in infinite space and teeming with animalculæ, some of which are called men. Perhaps some gazer may be pointing his glass at this building, looking down thru the roof as easily as we look thru a pane of glass—looking into the very minds and hearts, seeing the thoughts and emotions of us all. What a grand yet terrible world this would be if all our thoughts and feelings were laid bare to our companions. I do not wish for the power to read all humanity's secrets now; it would burst our hearts to see in clear light the selfishness and wickedness and misery of men to-day, but when the millenium comes, when every man and woman obeys the law of love, when every mind and heart is full of beauty, then it will be grand to read the thoughts and emotions of others as an open book, and have them read our own.

A word about the agriculture of the future. With the aid of modern machinery four men can raise, mill and deliver to the bakers, flour enough to feed 1000 men for a year. That is only the beginning. It is found that electrifying the atmosphere increases the yield 50 per cent, electrifying the seeds produces an increase of 100 per cent and electrifying the ground increases the crop 300 per cent. A hundred years ago one-thirtieth of the people lived in cities; now one-third of the people live in cities. Soon everyone may enjoy the united benefits of city and country life, most people will live in or near some city. With fine roads and rapid transit, communication will be easy. Cities will be more evenly distributed than now. The few who attend to agriculture will have their automobiles and air-motor bicycles and can live in the city if they wish, and go to the farm in the morning at a speed of 50 or maybe 100 miles an hour with almost no expense.

What of education in the good time coming? Already it is growing

less classic and more scientific and practical. It will become more simple, effective, universal. We shall arrange the studies according to their natural relations, and in the order of development of the mental and moral powers. We shall aim more and more at the training of faculty and the development of lofty interests and emotions, less and less at cramming with facts. We shall think more and more of liberty, for teacher and student, and seek symmetrical self-perfection thru easy and happy self-culture under the teacher's general guidance. We shall sit in the schoolroom and see the Pyramids and the Alps, London, Paris and Hongkong thru the teleelectroscope. Moving pictures in life-like colors, with phonograph accompaniments will bring to eye and ear every industry and scene of action in the world. Our children will be educated in art galleries and music halls; and the school will be one long delight. The twentieth century will not be satisfied to give but one-tenth of one per cent of the youth a full education. Think of the waste of mental and moral resources—only one-thousandth of our youth with full opportunity of intellectual and emotional development. This century has seen most wonderful progress. It has produced 35 great inventions and practical applications of science, as against 31 in all preceding ages. Its scientific and moral advance has also exceeded the totals of all preceding centuries put together. If such results have come with imperfect culture of one-thousandth part of our mental resources, what may we expect from reasonably perfect education of the other 999 thousandths, or of the whole youth of the nation?

Simplicity is needed, not only in education, but in language, literature and law, government, industry and society. We must select and coördinate the essential and get rid of the trash. We ruin our nervous systems rushing thru endless masses of useless ideas and actions. If we keep on no man will be able to know the law or understand the literature of his day. As I lift the curtain of the future, I can see conventions of learned men selecting and condensing, so that a man may grasp the best thoughts of the past and present without destroying his health. Another convention may build a universal language to be taught in all the schools of every civilized country—a few hundred words at first, so that one may be understood wherever he goes—a complete phonetic language, at last, into which the most valuable books of every tongue will be translated, a process which in itself will result in a vast weeding out.

Disease may be eradicated by science and careful training in the

laws of health. Even old age may be indefinitely postponed by pure water, good food, and normal, moral, happy living. Intemperance and crime will be banished by education, hypnotism and wise preventive measures. The last drop of savage blood will be squeezed out of the veins of humanity; and mankind will stand forth pure and noble, subject to no law but the law of love and conscience.

And what of government, industry and religion? A word must suffice. The sweep of events is toward liberty, union, justice, equality and democracy. The century is full of the movement. Religion is becoming a life instead of a doctrine, and the time will come when all religious men will unite in one great church of brother love. Liberty has grown enormously. A few hundred years ago the people in power put thumb-screws on those who differed with them, or burned the dissenters at the stake. To-day they only abuse them in the newspapers, or take away their employment, or ostracize them. The time will come when men will be openminded enough to receive with eager courtesy the thoughts of others, according them the same liberty of thought and expression they wish for themselves; and, recognizing the fact that the past cannot think for the present, that no one has all the truth, and that the only way to get it is for each to listen to others, candidly and receptively, cherish a desire to discover and proclaim whatever is true and good in the thoughts and feelings of other men. Signed journalism and the abolition of commercial cannibalism will do much to usher in this happy time. In America, and in Europe except as to Russia and Turkey, monarchic and aristocratic despotism has given place to constitutional government with more or less republican forms. The feudal system and chattel slavery have been abolished. Three continents are free and the rest are coming. It is true that a new despotism is looming up in the giant trusts and combines, but as with former despotisms, the power and benefits of their organization will be kept, but the monopoly element will disappear. A trust is all right if the public is inside. A plutocratic trust is bad, but a democratic trust is good. A private combine is tyranny, a public combine is beneficence, if the public control is really public, and not a pretense. Good government and industrial partnership are sure to come. The interests of the people demand them, the logic of events requires them, and the law of love compels them—love, sympathy, and intelligence are growing, and that means that conflict and competition must give place to harmony and coöperation.

Do you say, This is all very pretty but it is impracticable—a dream that will not come true—an ideal that cannot be realized? I reply that it is possible to *think* of these things now, and if we keep on thinking about them it will be possible to *do* them pretty soon. It is a mistake to think that the ideal is the impractical. The ideal is the basis of the practical, the prophecy of the practical, the creator of the practical. Every invention, every book, every institution was an ideal before it was a fact and became a fact because it was an ideal.

The ideal of independence rose in America. England resisted it. It took up arms, defended itself and conquered. Is victory over Great Britain a dream?

The ideal of a united Germany grew in the Teutonic mind. It was the dream of students and visionaries. But Bismarck had the dream. It possessed his soul; and thru him it organized armies, threw Austria out of the German confederation, laid France in the dust and crowned King William emperor of Germany.

Jesus taught the ideal of a life of loving service, a life of devotion to truth and kindness and nobility, a life dominated by love, and this loftiest of all ideals is recognized as the most powerful force in the world to-day.

Luther conceived the ideal of independent thought; and the ideal tore Europe asunder, drenched her soil with blood, crippled the power of popes and creeds, and gave the world a religion that at last is beginning to manifest some tolerance of those of differing faith.

Garrison, Phillips and Lincoln dreamed of freedom for the blacks—the ideal of political liberty for all men, regardless of color. That ideal brought a conflict which put a million men in arms and cost five thousand millions of dollars and on the field of battle wrought itself into realization.

To-day there is a new ideal—the ideal of more perfect democracy—diffusion of power, intelligence, virtue and wealth; equalization of opportunity; coöperation; brotherhood; the law of love as supreme in politics and industry and society as in the home. It is simply the ideal of Jesus, of Luther, of Jefferson, of Hamilton, Garrison, Phillips and Lincoln carried into industrial, political and social life. Will you accept this grand ideal and work for it? In my judgment the man or woman who does not do so is missing the best of life. The man or woman who does not work for a great ideal forfeits the highest privilege of a human being.

THE REAL AND PERMANENT GRANDEUR OF THESE STATES.

Abstract of a Commencement Oration, Given at the Kansas State Agricultural College, June 8, 1899.

BY BENJAMIN FAY MILLS.

I TRUST that some of us have recognized this title as a line from one whom I regard as our greatest American prophet, Walt Whitman. The real and permanent grandeur of these states is to inaugurate a new era: the era of the actualization of the accumulations of the efforts of ages past. This is known as the century of practical invention, but it is not so much the century of practical invention as the century of spiritual discovery; the discovery of a principle. We have comprehended for the first time in history, the great, transcendent fact of the harmony of eternal, immutable law with progress, and we have comprehended this not simply by a study of philosophy or even by the discovery of the epoch-making fact of evolution, but we have discovered it because of the accelerated movement. We can all see the little hand move around upon the watch; we are none of us endowed with eyesight fine enough to detect the movement of the hour hand or even of the minute hand. What this century has done for us is to give us, not only thru our philosophy and thru our science but thru our observation (the best basis for our philosophy and for our science), a grasp of the fact of movement. The rate of development in our time has been so accelerated that we have actually become able to see humanity move. The first great discovery of this century has been order: the second has been growth: and these two in the last analysis are one. The key-note, then, of our century is orderly growth.

Professor Wallace points out that this century is to be compared, not with any previous century, but with all the rest of the centuries put together. There have been, according to him, something like nineteen great discoveries in the world's history until now, and of these nineteen discoveries twelve have been made in our present century and only seven in all preceding ones. There have been twenty great inventions in the world's history, two-thirds made in this century and only one-third in all the centuries that have preceded it. We are told in our Holy Book that one day is with the Lord as a thousand years and a thousand years as one day. We have come to a place where one century is equal to and surpasses at least three

hundred centuries of the past, and we are not able to conceive of the accelerated rate of progress at which the world will move in the future.

We hear that the pendulum swings now to this side, then to that. That was the highest thought concerning the development of truth, theological, philosophical, scientific, a century ago. We know better now. The pendulum does not swing like that. The movement of truth and of humanity describes not the arc, the path of the pendulum, but the spiral. We move from this side to that, but round and round, and upward. Now for the last century we have been living by what we call the deductive method—drawing conclusions from principles assumed to be true, but often untrue. The mind of man at last revolted from the thought that we were to take theories and make facts conform to them, whether real or not. We went to the opposite extreme, and said: We will believe nothing but what we touch, handle, know by the practical experience of our senses. We substituted induction for deduction. The very term science, the phrase scientific method, came to stand for the inductive method. We have almost gone around the spiral now, however, and having induced some theories from our facts we have learned to return to the deductive method and deduce conclusions from the principles reached by induction.

Now the one great principle we have discovered is this: Progress! progress! The world never knew it until our own day. This is the principle, and it is time for us to act again for a while on the philosophic rather than the scientific plan; to learn with eyes rather than with tentacles; to take the consciousness of the race and work it out in practical development. If American men and women that are living and awake in this our supreme day will receive their inspiration, not from that which has been, but from the future which never was, not from a golden age in the past but rather from the glory of that which is to be, we will then be prepared to go on and make the world, and perfect that which has entered into our experience. If I had the time and you had the patience I might point out some of the applications of this principle and show how the new philosophy would change all our individual conceptions and experiences and transform the world.

The new watchword is, look up and not down, forward and not back, out and not in, and lend a hand. So far as the individual is concerned, the expression of faith by love is the practical religion of

the day. It is not my purpose, however, to have our minds turned to the individual, but rather to consider this great truth of development as applied to us all, namely, to our nation—The real and permanent grandeur of these states! I do not care so much whether you lose the sermon if you keep the text. Let that sink into your souls.

The real and permanent grandeur of these states, what is it? It is to be a pioneer. America was born with the discovery of gunpowder, the great social leveler. Some one said that the man with the gun was equal to the man on horseback, and it was the invention of gunpowder that exploded the old feudal system and brought in the great system of democracy. America was discovered not long after the invention of printing, and the printing press was the great intellectual leveler. Formerly there was the prince on horseback and the peasant and serf on foot. Gunpowder made them equal in physical power and in social position.

The man with the book was the man of the cloister, the priest; he was the guardian of the collected wisdom of the centuries, and practically ruled the word. The invention of printing destroyed this intellectual advantage until, to-day, if one man is not so wise as another, so far as the wisdom of the ages is concerned, it is his own fault. We, as Americans, came into being in near connection with this great discovery. Real education began with America. At the birth of this wonderful century of inventions, discoveries and sciences, Fröbel lived, the first great teacher who has spoken to the world the solemn and sacred word, Education. We have discovered science itself. The scientific method is largely of this century, the one century of our national life. The great sciences of the relation of people to things, of things to people, and of people to people, the greatest sciences so far as we are concerned, the sciences of economics and sociology, have been entirely coterminous with the development of our national life and the progress of democratic ideas—the development of the germs of a greater religion.

The fact is, we have developed so that heroism has become an every-day occurrence. It has become a common thing to witness on the part of what we call ordinary people the divinest manifestations of altruism. Our ships at Santiago sent terrible messengers of divine retribution. These to some people would express the nineteenth century, but they are left over from the past age. There were other things which were sent from those ships which more

truly expressed the close of the nineteenth century—that cry of Captain Phillips, “Don’t cheer, boys; the poor devils are dying!” The marines who, tho possibly in no instance professing Christians, rushed forward into those blazing hells to save the lives of their enemies, refusing to return until they had done their work, were urged on by what was to them the divinest consecration.

These are expressive of the time in which we live? I believe the realities of this day, if we had time to see, would surpass our profoundest thoughts and most iridescent dreams. The real and permanent grandeur of America is to bring the world to a consciousness of its present position and inspire men with larger views and hopes for the future for which they have long been accumulating materials. America brings builders; and their work must surpass that of all peoples who have ever lived. These states are the amplest field of civil life that history has yet known. Here is not merely a nation, but a teeming nation of nations.

Now then, what does this mean? It means in the first place, that the real and permanent grandeur of these states is to produce a new type of individual manhood and womanhood, an American type; to be like nothing that has ever existed upon the earth. An American is wicked if he resembles anything that is not better than anything that has formerly existed on this planet. You remember Lowell’s words in his commemoration poem, speaking of one of our great leaders:

Nature, they say, doth dote,
And cannot make a man
Save on some worn-out plan,
Repeating him by rote.

For him her old world’s mold aside she threw;
And, choosing sweet clay from the breast of the unexhausted West,
With stuff untainted shaped a hero new,
New birth of our new soul, the first American.

Now whether that was true of Abraham Lincoln or not, there certainly should be a new birth of our new soul, a new type of man, kinder, greater, braver, nobler, profounder, looking more into the future instead of the past, diviner than ever was on earth before.

A dream of joy comes o’er me.
A glory shines before me
Of what mankind shall be
Pure, generons, brave and free,
A dream of men and women
Diviner but still human,

Solving the riddle old,
Shaping the age of gold.
Of love to God and neighbor,
Of equal handed labor
The richer land where beauty
Walks hand in hand with duty.

O men and women, the mission of history and of tradition is not to give models or patterns. The man who judges the future by the past is an infidel. The man who makes the most out of anything but the *Zeit Geist*, which is another name for the Holy Ghost, is an infidel. His own ideal of what ought to be is his experience and his practise. Let me illustrate. It is a vastly more significant thing that in the year 1899 there was a Kansas State Agricultural College with such a degree of enlightenment as is possessed here at Manhattan, than that any theory of any kind is taught within its walls. It is a mark of the real development to which the world is coming.

We have a poet in Boston, named Sam Walter Foss. If you have not been to Boston I hope you will come. There is no place on earth like it. I heard of a man who asked his way from the same policeman in Boston eight times. Mr. Foss wrote a poem called the "Calf Path." I don't remember all of it but it runs like this:

One day, thru the primeval wood,
A calf walked home, as all calves should;
But made a trail all bent askew,
A crooked trail as all calves do.
Since then three-hundred years have fled.
And I infer that calf is dead.

A dog sees the path and takes it; a bell-wether sheep comes later and you know what the other sheep do. Later, men followed that path because it was already marked,

And many men wound in and out,
Twisted and turned and dodged about,
And uttered words of righteous wrath
Because 'twas such a crooked path.
But still they followed, do not laugh,
The first migrations of that calf.

After a while the path became a road; the road became a village street; the village grew to be a city. And—

At last the central street was this
Of a renowned metropolis.
And men two centuries and a half
Trode in the footsteps of that calf.
For thus such reverence is lent
To well-established precedent.

This is as far as some people have come in their development, and even in this exceedingly enlightened presence I do not doubt we can discover some individual whose highest mission is to wend along the path in which some other calf first went.

There is only one object in this world, one great object; that is to make men and women free. Men and women search for freedom. The search for freedom is not freedom. That is the reason that some who search for freedom are bound with heavier chains than those who live contentedly in bondage. What we want is the real freedom to think, work and create. Here is Mrs. Stetson's poetry again:

It takes great strength to train
To modern service your ancestral brain,
To lift the dead weight of unnumbered years
Of dead men's hopes, methods and fears.
But the best courage man has ever shown
Is trying to get loose and think alone.
Dark as the unlit chambers of clear space,
Where light shines back from no reflecting face,
To think anew it takes a courage grim,
As led Columbus over the world's brim.

And every American that is an American, an American and not an Egyptian, is a new man or new woman in his conceptions, his thought, his principles and his practise.

In the second place the real and permanent grandeur of these states is to establish a new ideal of education. The old way in education was anything but education. It was to try to fill up the child's mind exactly as we fill a tooth. Yet not exactly in the same way. We do put new gold into our teeth, but it was as tho we should fill our teeth with gold that had been taken from our ancestors' teeth.

That was the idea of education until Pestalozzi and Fröbel came into the world. It was to take this new-born mind, and, instead of seeing how much of a mind it might be, to see instead how full it could be crowded with old ideas that had no natural connection whatever with the new mind. Now I reverence the ancients, but, mark you, the ancients are not the people who lived four thousand years ago; they were the infants. We are the ancients ourselves. If there were some way for Moses, Solomon, Socrates, Marcus Aurelius and the rest of them, with their centuries of added growth, to communicate with us and tell us what they now know, and we could comprehend it, that would be worth while; but for most of us that is not practicable. I will not worship either my

ancestors or descendents but, were I compelled to choose between them, I would reverence the children who are yet to come, rather than the men of the past, for those children are going to be greater than these men. The word education should not be prostituted to mean cramming the mind with old beliefs and ideas. The word education, literally translated, means to lead out, not to cram.

Michael Angelo said when seventy years old, "I am still learning." It is pitiful as well as ludicrous the way we talk about our "institutions of learning." I do not know of more than one institution of learning on earth. This is not an institution of learning; I do not mean to depreciate it; it may be desirable to have some institutions of teaching. Maybe there are departments here for making discoveries; such only are institutions of learning. Some at the same time are teaching the knowledge and learning the knowledge of the future. The knowledge of the past is full of absurdities. Why should *ough* and *ough* be pronounced in so many ways as in the words cough, rough, slough, laugh? Why should we perpetuate such anomalies as a part of our educational work? By displaying such blind reverence for the past, we prove that we are as truly bound in chains as are the Chinese. Education is not the filling of young minds with dead men's thoughts.

I should hardly dare to speak as emphatically as I would like to on this subject. I fall back on our great universal prophet, Emerson. I will give you what he thought of some aspects of our modern system of education.

We are students of words. We are shut up in our schools and colleges and recitation rooms for ten or fifteen years, and we come out at last with only a memory of words and do not know a thing. We do not think we can speak to the divine sentiments in man, and we do not try.

What a glorious opportunity for education, to speak to the divine sentiments in man! But where is the school or college that exists only for this end? Where is the educational institution that feeds on faith in humanity and the progressing, growing God that is in the human soul? The whole object of the school should be not to cram students but to awaken originality, to make them discoverers of truth. The principal of one of our preparatory schools said to me, "I would like to have you know that we conduct this school just as nearly as possible, in the way in which it was conducted forty years ago." He seemed to think that was glorious. I believe the growth of our state institutions of learning is one of the most resplendent

signs of our great times. The endowed institution is an anachronism. Harvard University is foreign in its principle compared with this College at Manhattan. The endowed university is devoted, to a great extent, to teaching either what dead men thought or what living men think, who do not think, in order that it may live and get provender to exist. It would be better to strangle your children, and give them a chance with wiser parents in a new incarnation, than to rob them of their right to a true education by penning them up in institutions that do not discover, and do not believe what they teach.

A state institution of learning should offer to students the fullest known truth and opportunity to discover more. To discover God's best thought and interpret it to man is glorious; but a state institution founded or forced to teach any dogma—or set of dogmas in philosophy or politics or science or religion—is a misrepresentation of the spirit of the times. It is disloyalty to the mission of America. It is worse than the Chinese mother who only binds the feet of her daughter, while this mother binds the brain and heart and conscience, and is worse than a Caiaphas or Judas. The state institution is divine. The Messianic spirit of our day has made possible the birth of the higher institutions of learning from the people for the people and by the people.

I don't care for the application. I wouldn't go across the street to make a plea for any political party whatever. You may make the application yourselves. I have not traveled 2000 miles simply to sing sweet songs or say pleasant things. I am not a partisan. I am capable of voting a different ticket at every election. All our people are simply people, and these political combinations are merely artificial. If our professors must be political or religious dogmatists, and if they can not be trusted to be fair, then let your state be great enough to provide teachers to teach all the dogmas. It would be better to have, not one or two expounders of philosophy, but enough to teach all kinds of philosophy than to stifle the spirit of progress or fail to give inspiration. The man who would poison the food of youth is intelligent and humane when compared with officers of the state who endeavor to control the teachings of a public institution in the direction of any dogma, old or new, and insist on the holding of a correct set of ancient or modern opinions about anything, instead of inspiring young men and women with a passion for real culture and for opportunity to grow, develop and achieve.

We come now to my third thought which is that the real and per-

manent grandeur of these states is to make a new society. We never have had any society in the minds of men until our own century. The word society, as I use it now, is a new word that did not exist with that significance twenty-five years ago. It was not even in existence. Society is not sick, as sometimes alleged. It is afflicted simply with growing-pains.

We have simply arrived at one of those supreme moments when an old world passes away and a new world comes into existence. Every greatest thought is a world thought. All great thoughts have been held by individuals at various times, but the greatest thought in the mind of the world that existed previous to our century was the value of the individual. Woe be to the world if it ever loses the inspiration of that thought—the value of one mind is mightier than the material universe. This is the lesson of Christianity—the value of the individual; and it has done a mighty work. It has broken the shackles from the slave. It has enfranchised the lowly. It has lifted up the child and recognized his right to live. It found its perfect political expression at the close of the last century in the French Declaration of the Rights of Man and then in the American Declaration of Independence, with its avowal of the right of man to life, liberty and the pursuit of happiness. It gives us the idea of rights.

But we are coming to see something behind this. This is the day of what our German professors call the social consciousness. Society is becoming conscious of itself. This value of the individual was not the greatest thought that the world could think. We are learning to think of men in society, not as the sand upon the sea shore nor as a vast building planned by some great builder, but as a living, growing organism. As a physical man lives and learns, so humanity lives and learns. The life of the race is of more moment than is the life of any individual. Men live and die but they live only in so far as they contribute to the growth of humanity. This idea of the social organism gives us a conception (shall I say?) of duties rather than of rights. A new duty simply enlarges our rights. The supreme right of man is his right to do his duty. A new idea is struggling to be born, the idea of equality in unity. In industry or commerce we call it coöperation, in ethics we call it brotherhood, in politics we call it democracy, in religion we call it love. Man by endeavor, is finding his place in the universe; he is a part of the universal whole. Mark this: what is going on now,

that so disturbs the minds of some and fills others with enthusiasm, is the application in our own time of this principle of democracy to all forms of human society.

A new light is being shed to-day upon the democratic principle and the need for its application by the science of economics. We live in a day of great wealth. Mr. Gladstone said that more wealth was produced in the first fifty years of this century than existed at the beginning of the century, and more wealth was produced in the twenty five years following that than in the preceding fifty—more wealth than existed in the whole world at the beginning of this century. The question arises, What do we do with it? One hundred years ago men were just beginning to ask how wealth was acquired; they had never thought of that before. In the middle of the century the question came, How is it distributed? but it is only in our own day that people are asking the question, How should wealth be distributed? It is not an indication of degradation that at last we have awakened to ask the question, How should wealth be distributed? It is rather a sign of growth.

We know that great fortunes have been acquired without any equivalents given to society therefor. I do not mean that the acquisition of these fortunes was dishonest, judged by our present standards. But it is so, judged by the standards of the future. How are great fortunes, in fact, acquired? First, by inheritance. No man ever earned an inheritance. Second, by interest. No man ever earned what comes to him as interest. I knew a man who was so fascinated by the thought of money earning more money that he piled up his securities about the head of his bed and then lay awake all night to hear his wealth accumulate. A third source of great fortunes is the appropriation of the natural riches of the earth. Americans are fighting the 10 per cent tax on the gold of the Klondike. The fortunate men who stumble on it, and give only 10 per cent to the Canadian government, are allowed to take 90 per cent of the gold for themselves. Every well informed man exults in the fact that Canada takes as much as 10 per cent; she ought to take 90 per cent and give them the ten. This wealth does not belong to individuals but to the people. A fourth means of acquisition is by the unfair division of the profits of industry. The working man is becoming separated from these five things:

1. From his employers. The time was when the working man and the employer lived together and worked together side by side.

The working man married his employer's daughter and succeeded to the business and conducted it until his working man married his daughter and succeeded to the business. Now the working man does not know his employers at all. A man might sit in an audience room like this and touch the elbows of the principal stockholders of the corporation he works for and have no knowledge of the fact that one of his principal employers was near him. One may own stock in a railroad and not know a single one of his employees. Workers are called not men and women, but hands. Between them and their employers are managers. The manager does not have to be a devil with the pressure put upon him by the corporation to make it his aim to get all he can out of the hands. He has simply to let the system work.

2. From his tools. I saw an estimate that if the materials for an ordinary 75-cent breakfast had to be gathered for your exclusive breakfast you would have to take the labor of 500,000 men and a cost of \$5,000,000. The time was that if a man wanted to go into the transportation business he would get a wheelbarrow, and after a while he would get a horse and wagon; but if he wants to go into the transportation business to-day he has to buy a railroad. Then the manufacturer had his factory in one room of his dwelling; now you know what the factory is. We are all dependent on it, and we ought to be, for it is a divine process, but it has separated man from his tools.

3. From his hopes of real development. John Stuart Mill doubted whether machinery had lightened the day's toil of a single human being. Machinery has done wonders for producers and is to-day doing wonders still. We know it does. It used to take a man to make a pin, but it does not now. Machinery makes the pin and the man simply works a lever backward and forward. The very invention that ought to have given this man leisure has resulted in such a helplessness and steady drudgery on his part that he can never be at home to look upon the faces of his children while they are awake. The invention that ought to have given him opportunity for growth and culture in a hundred ways is narrowing his brain. At the same time he sees his employer building his magnificent private house, planting his private park, launching his private yacht at the cost of \$300,000, and building his private railroad car to cost \$75,000; and some say that, if that employer is in need of it, he can have his private legislature, private governor, etc. And so he goes smiling around, never seeming to have a conviction as to the in-

herent injustice of the process, and only occasionally a twinge of conscience, while he never thinks of making a sacrificial offering of himself for other men.

4. The worst thing is that the working man is becoming separated from his work. What is most pitiful in it is the man who wants to help God make the world cannot get the opportunity. How can you sit here and hold your heads up when you know there are millions of such men? It used to take a man to make a whole pin, but a woman can move a lever; and the woman crowds out the man, and the married woman or the woman with a family crowds out the single woman who has no other means of support, and then the child crowds out his mother, and to-day there are in every market place in America crowds of noble, honest men who want work but have been elbowed away by the competition of their own children. To this competition must be added the competition of the Orient. Far across the sea there are Japanese who are better metal workers than we. They can live on thirty cents a day. Over beyond are the Chinese who are better in some things than we can hope to be. They live on three cents a day. You may put up as many tariff barriers as you please, but competition among workers is a world question.

5. The ordinary workman is separated entirely from political power. He calls himself the citizen of a great democracy, but he holds hardly what Carlyle describes as a thousandth share of one talker in the national palaver. I do not mention this in a spirit of pessimism or controversy, but to illustrate social conditions. I can see defects in any belief or radical thought that can be proposed for the reconstruction of society, but I can see worse defects in the continuation of things as they stand; and the real atheist is the man who believes that any present order is divine, when compared with any future order. It is divine only as compared with the past. Let me ask you some questions. Why should the wealthy man be the idol of society? Why should the character and issue of money be controlled by a few men instead of by many? Why should the heart of our national and business life be a den of thieves and robbers dignified by the name of stock exchange? Why should machinery, one of God's greatest gifts to man, enslave men, making them idle when they ought to be noble and free? Why should we work ten hours a day under hard conditions when plenty might be for all with much less work in easy circumstances? Why should one-tenth of the people in Christendom never be free from hunger?

Why should ten millions always be hungry? Why should one man save three million dollars by putting in his best endeavors to manage a railway, while another works as earnestly and honestly and is not able to save three cents? Why should the hearse go twice a week for sixteen years to a single block in New York city while it does not go once in sixteen years to other blocks that may be pointed out in that same city? I find the poor coming and carrying away the leavings of prisoners in the penitentiary to keep themselves from starving to death. Why?

Now I know that we never give up anything that does not seem inappropriate to us. Talk about sin all you please. We will stop sinning when it seems inappropriate. It is inappropriate for America to continue the competitive system, to fail to give equal opportunities to all men, to trust mere politicians, or, still worse, to trust no one, to enthrone greed, to protect monopoly anywhere on this continent, to be the slaves of a senator in Pennsylvania, of a boss in New York, of a street railway in Boston; to have a Back Bay, with the houses of the rich on this side and the slums of the poor on that, to be the slaves of anybody in politics or out. All these, and other possible illustrations of present social relations, are as inappropriate as for me to get down on hands and knees and crawl as we used to crawl when we lived in the reptilian age.

The real and permanent grandeur of these states is character in politics. Independence, just freedom, the fair breezes that blow the ships across the ocean come from the lungs of liberty, industrial effort. If God could ever succeed he would succeed now in America. Here are our great American ideals. First the political ideal. The greatness of these states will come when a man would rather pay his taxes than give presents to his children. When we come to that ideal there will be no taxes. He will do it because it is a contribution to the largest family he knows except the greater family of united humanity. Who ought to be the holiest man in the city? the Mayor. Who ought to be the holiest man in the state? the governor.

I think I know what it means to be thankful that I was born in a home where there was a devout father and a mother that, to their best light, feared God and worked righteousness. But I think a man might better be sacrilegious in church, might better deny his father and scorn his mother than be disloyal to the state. It is a holier, higher and more inspired fellowship than that of either the family or the church.

The second great ideal of America, politically, is the glory of democracy. It is this ideal that has caused the turnings and over-turnings until this present hour in the whole world. In its full perfection democracy is simply the human expression of the unity of all life. Democracy and life are one. Read history. See how the soul of the race has moved onward. Democracy seeking expression, that is the soul of history, that is all there is of history. It found expression in Greece, in Rome and in the France of 1793. These all died in infancy. There have been expressions of democracy that died before they were born. These were all different from America. They had old materials; but we have new, on which the soul might work. With America came the birth of real democracy. This democracy is the hope of mankind.

Our highest ideals are the ideals of the nation and of society. That is the great moral lesson that we need to learn. We have outgrown dueling. I am not going to talk about imperialism or expansion. I am not concerned about expansion only that to spread us out too thin would be an infinite misfortune. If we are to have American expansion it will be expansion by love; and we are to win our conquests as a lover wins his bride, rather than as a conquerer overcomes his enemies. That is as certain as that we are here. There is no sort of revolution that has force and selfishness in it but will have to be revoluted again. We being what we were, the Spanish being what they were, and the Cubans being what they were, I presume we had to have the Spanish war. If we had left the war for thirty years longer we would not have had to fight at all, but it was all there and we had to do what we did. But that is not ideal. There were no truer words spoken by Christ than these: "Nations are gathered together before the throne for judgment;" and the nations that have been good and loving and tender go into the everlasting mansions, and the nations that have been selfish, narrow, mean and cruel go into everlasting punishment; and I see them going, all the way down the ages. I see Turkey staggering into hell to-day. The words are true. I shall not make any remark about national expansion, but O, friends, I believe that the real America is to-day at The Hague making proposals looking toward universal peace; and the very first nation that being smitten upon the one cheek turns the other to the smiter, the very first nation that forgets the word vengeance, the first nation that lives as I would live with my wife, and you, mother, with your child, that nation will do the very greatest amount of good

for the bringing in of that golden time toward which the world has looked. Oh that the swords I know might here be turned to reapers' tools.

And now for the fifth thing, I have spoken of the new manhood and the new education and the new society and the new politics. I will now complete for you this quotation from Whitman. "I see that the real and permanent grandeur of these states must be their religion, otherwise there is no real and permanent grandeur," This is the profoundest philosophic sentence I ever heard:

Religion is that fine sense of the soul that connects the individual with the universal purpose.

This is true not only of us as individual men and women but true of the nation. I have been preaching this morning, if I ever preached in my life. I have been talking about nothing but religion from the second I rose until now. The universal purpose of mankind is brotherhood. It is democracy and real religion. America is religion. Every ideal of the United States is a religious ideal. The right of every man to life, liberty and the pursuit of happiness is a religious ideal. The value of the individual is a religious ideal. Social and political equality is a religious ideal. The public school, advanced educational institutions, are religious ideals. The tendency toward collectivism is a religious ideal. On the one hand the trades unions and on the other hand the associations of capitalists, these are religious ideals. And the trust itself, the finest material expression the world has ever seen, tho it may be hellish in its method, is a religious ideal. God thru it is making the wrath of man to praise him.

As Frances Willard said, "Who ever speaks of competition breathes out a curse on the world, and whoever speaks of coöperation breathes out a blessing." It is time that the nation was convicted of sin and converted to religion. So religious must we grow that we become prophets ourselves, that our old men will see visions and our young men will dream dreams, and the people see the national purpose, the soul. The great need of America is that we glory in this spiritual vigor, in this higher potential and essential nature that has yet to manifest itself in the American people. We must learn to find in American history the soul of our country. Then shall we cease to be discouraged by the mire of commercial selfishness thru which she may drag herself. Then shall we preserve our patience a while until she finds her way thru the commercial and political anarchy. Then shall we have that enthusiasm born of faith

that thru all steadfastly takes hold of things within the veil. Then shall we work with wisdom, applying eternal principles to practical affairs.

I am an optimist of the optimists. There never was so great a day as this, but there is a greater day coming. Men will have to keep on the run to keep up with it. The greatest woman of America said, "To-day against yesterday, to-morrow against to-day." We know not what discoveries are yet to be made, but there are more and more coming. Having done so much we feel sure man will do yet more, and lead us into those seeming mysteries in the days to come. I know not what invention shall yet lessen human toil, but religion possessing all will make our toil glad and all struggle a joy. I know not what spiritual instruction is waiting to be realized, but I know it will come, and so do you, when all the millions shall speak with the same language, and the loud clamor of the many tongues of Babel shall here be harmonized by a spiritual, commanding pentecost into that religion that shall be forever and forever.



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- MISS MINNIE A. STONER. (Boston N. S. of H. A.), B. S. (S. D. A. C.) M. E. Parsonage, Poyntz ave
Professor of Household Economics, Dean of Domestic Science Department.
- JOHN D. WALTERS, M. S. (Kansas State Agricultural College)..... North end of Sixth street
Professor of Industrial Art and Designing.
- MISS MARY F. WINSTON, Ph. D. (Göttingen)..... 1211 Moro street
Professor of Mathematics.
- JOSEPH D. HARPER, M. S. (Rose Polytechnic Institute) ... Houston st., between Fifth and Juliette
Professor of Mechanics and Engineering, Superintendent of Workshops.
-
- Professor of Military Science and Tactics.
- ALEXANDER B. BROWN, (Boston Music School), A. M. (Olivet)..... Corner Juliette avenue and
Professor of Music. [Houston street]
- FREDRIC AUGUSTUS METCALF, O. M. (Emerson College of Oratory) Corner Poyntz avenue
Professor of Oratory. [and Sixth street]
- ERNEST R. NICHOLS, D. B. (Iowa Normal), B. S., A. M. (University of Iowa)... 512 Houston street
Professor of Physics.
- CHARLES S. DAVIS, (Kansas State Normal School)..... ¼ mile west of College
Superintendent of Printing.
- PAUL FISCHER, B. Agr., M. V. D. (Ohio State University) ... Juliette avenue and Humboldt street
Professor of Veterinary Science and Biology.
- MISS HARRIET HOWELL, (Pratt Institute) Superintendent of Sewing... Moro street, near Tenth
- MISS ALICE RUPP, (Indiana State Normal), Instructor in English... Poyntz avenue, cor. Seventh
- MISS JOSEPHINE C. HARPER, Instructor in Mathematics..... Corner Sixth and Pierre streets
- MISS HELEN J. WESCOTT, Librarian..... Juliette avenue near Leavenworth street

Assistants and Foremen.

- William L. House, Foreman of Carpenter Shop..... Corner Sixth and Colorado
- R. W. Clothier, M. S. (K. S. A. C.), Assistant in Chemistry..... Cor. Fremont and Sixth streets
- Royal S. Kellogg, M. S. (K. S. A. C.), General Assistant..... Cor. Sixth and Fremont streets
- J. M. Westgate, M. S. (K. S. A. C.), General Assistant Cor. Fourth and Leavenworth streets
- Wm. H. Moore, M. S. (K. S. A. C.), Foreman of Greenhouses, Manhattan ave. near Laramie street
- C. P. Hartley, M. S. (K. S. A. C.), Assistant in Horticulture..... Seventh and Bertrand streets
- Mrs. Mary L. Hanson, Superintendent of Dining Hall..... Domestic Science Building
- Charlotte J. Short, M. S. (K. S. A. C.), Ass't in Household Economics, Leavenworth near Juliette
- Enos Harrold, Foreman of Iron Shop..... Manhattan avenue, south of Moro street
- Margaret J. Minis, Assistant Librarian..... Fourth and Moro streets
- R. B. Mitchell, B. S. (K. S. A. C.), Cadet Major and Acting Com. of Battalion, Osage, near Juliette
- Lorena M. Helder, M. T. (Kan. Con. of Music), B. S. (K. S. A. C.), Ass't in Music..... College Hill
- R. H. Brown, M. T. (Kan. Con. of Music), B. S. (K. S. A. C.), Ass't in Music..... 202 Juliette ave
- Mrs. Winnifrede W. Metcalf, Assistant in Oratory..... Corner Poyntz avenue and Sixth street
- S. N. Chaffee, B. S. (K. S. A. C.), Principal of Preparatory Dept. ... Moro street, bet. 8th and 9th
- Olive Long, B. S. (K. S. A. C.), Clerk of Postoffice..... Near northwest corner of College
- J. D. Rickman (I. T. U.), Foreman of Printing Office..... Cor. Tenth and Kearney streets
- C. Jeanette Perry, B. S. (K. S. A. C.), Assistant in Printing Office.... Corner Colorado and Fifth
- Ora G. Yenawine, B. S. (K. S. A. C.), Assistant in Sewing... Corner Humboldt and Sixth street
- Chas. W. Pape, M. S. (K. S. A. C.), Ass't in Vet. Science and Biology..... 1104 Moro street

Assistants in Experiment Station.

- D. H. Otis, M. S. (Kansas State Agricultural College), Dairying..... 814 Houston street
- J. G. Haney, Feeding and Field Work Corner Manhattan avenue and Kearney street
- G. L. Clothier, M. S. (Kansas State Agricultural College), Botany..... Fourth and Leavenworth
- P. J. Parrott, A. M. (Kansas State University), Entomology..... Juliette ave. and Fremont street
- W. L. Hall, M. S. (K. S. A. C.), Horticulture..... Manhattan avenue and Fremont street

OTHER OFFICERS.

- Wm. Canfield Lee, A. B. (Kenyon), Private Sec. to Pres..... College Hill, 1 mile west of College
- Lorena E. Clemons, B. S. (K. S. A. C.), Assistant Secretary..... Corner Fourth and Laramie
- Eugene Emrick, Janitor..... Leavenworth street, near Eighth
- Jacob Lund, M. S. (K. S. A. C.), Engineer..... South gate of College

THE INDUSTRIALIST.

Published ten times per year by the Printing
Department.

KANSAS STATE AGRICULTURAL COLLEGE.

Manhattan, Kansas.



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PROF. JOHN D. WALTERS, Local Editor.

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REGENTS ON THE COLLEGE CHANGES.

AS the culmination of the movement beginning with the suspension of the two college regents, the following resolution was offered in board meeting, Saturday afternoon, June 10:

Resolved, That the interest of the Kansas State Agricultural College requires that the services of the following named officers and professors of this College be dispensed with after June 30, 1899: President Will, Professor Bemis, Professor Ward, Professor Parsons, and Secretary Phipps.

Regent Vrooman said: "*Ladies and gentlemen*—I rise to oppose the passage of this resolution and to protest against action of this character. I believe the effect will be mischievous. At our last meeting a resolution was introduced, rescinding the engagement made with Mr. Wm. J. Bryan to deliver the commencement address in this city. I told the board at that time that the passage of the resolution would be a mistake; that they would receive much more censure for partisan action if they withdrew that invitation than if they let the action of the other board stand, since it had been taken and the matter presumably was settled. But this board became responsible. Events have showed that I was wonderfully correct. The board has been roasted by the press all over the country. The republican press has censured the members. The republican party has repudiated that action as far as possible. It is ashamed of what was done.

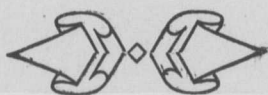
"But the mistake made at that time in canceling the Bryan engagement was nothing in comparison with the mistake now about to be made. If these professors are dismissed on the slight ground here shown, nothing will persuade the people of the country that this is not a political movement. The word will go abroad that this institution has been prostituted for political ends. Were there mitigating circumstances it might be possible to convince at least the republican party that this action is for nonpolitical motives. But I do not

believe any editor can convince his readers now that this is non-political. Take for instance Doctor Ward. He has degrees from three universities. When I was a student at Harvard I came under his influence, tho he was not my teacher. I revered that man, and my brother, who was under him in classes, told me what an inspiration and help he was to him. Now think that this man, teaching a subject not political, that does not involve political subjects, should have a lot of little preachers howling at his heels to say his religious views are not correct. I am greatly surprised at the removal of Doctor Ward. I had expected some such action with regard to the other professors. We have differed frankly and freely on economic questions and in regard to economic instruction. I came here expecting to make a fight and be downed, but I did not expect to see Doctor Ward thrown out.

"I want to make this point. There will be no possibility of explaining this thing any other way than that this educational institution has been dragged down into partisan politics. Two years from now I expect a change of majority. I may be wrong, but my expectation is that two years hence I will be with the party that will be in power. No matter what action you may take to-day, if I am on the board of regents then you may count on my standing up and making a fight against any partisan action on the part of the board of regents, but I tell you frankly that if you take this action at this time I expect at that time to be overwhelmed. It will be impossible to stay the tide of indignation, and in their rush of feeling the people will do things then which you and I must deprecate. This work to-day will be the starting point of things which I think will be wholly vicious. I shall fight against them, but I have no idea that if this motion carries the people's party will show the same forbearance they did in the past. You know that under Governor Lewelling and again under Governor Leedy we could have taken possession of the three state educational institutions. We could have kicked out every republican and put in populists, but we did not; and when we reorganized this institution we hired more republicans than populists. We hired two professors in economics who did not believe in the cardinal doctrine of our party. If this resolution passes I believe, in 1901, if the people's party comes into power, there is very serious danger that they will reorganize every educational institution in this state in a way which every friend of nonpartisan education must deprecate."

After Mr. Vrooman, Mrs. St. John addressed the board and said: "I cannot see why President Will should be removed. His work here has surely been of benefit to the scholars, and not only that, but you all must acknowledge his executive ability has been excellent. It has been just as good as you will find in any one else. You hold the power in your hands to guard and guide everything that has been done here. What you want is some one to execute what you propose. Professor Will has shown his capability of doing that. I do not see why he should be deposed, even if these professors should be deposed. If they have been teaching things you do not desire to have taught, these things are in the course of study. Eliminate them from the course of study and then there will be no need to remove the professors; but even if they should be removed there is no need to depose President Will when we have the power in our hands to say what he shall and shall not do. The old board put a great deal of power into his hands. This board can hold all the power from him to do any damage in the College or to promulgate any peculiar views. It is in your power to take that precaution and not make this removal at all. You all know that this institution has made great progress in every way in which an executive could control it. We have larger appropriations; we have no misapplied funds. Now that you have it in your power to order everything else, I do not see why you cannot keep the man at the helm who you know is capable of doing these things. Therefore I am opposed to the changes because you have it in your power to do these things; you have it in your power to take these precautions and then it will not be a partisan measure; but it does look like a partisan measure to take off the heads of these members, when you have control and can do just what you please even should they remain."

The question was put and the resolution carried.



ABSTRACT FROM PROCEEDINGS OF BOARD OF REGENTS.
June 6-12, 1899.

BOARD met, Tuesday, 9:30 A. M.; all present but Regent Fairchild, who was occupied with institute work in Manhattan during most forenoons of the board session.

The auditing committee presented its report.

The question of student uniforms was presented by the secretary, but no action was taken.

Students presented the following petition:

WHEREAS, We have evidence that material changes in the plan of management of this institution are being contemplated, and

WHEREAS, Such changes are of vital interest to the students; therefore, be it

Resolved, That we the undersigned request: (1) that the courses of study remain substantially as they are; (2) that the requirements for entrance be not raised; (3) that there be no sweeping changes made in the faculty; (4) that the bookstore and dining hall be retained.

Buildings committee reported in favor of employment of J. C. Holland, of Topeka, as architect and superintendent of construction of dairy building, to be paid $3\frac{1}{2}$ per cent of cost. Regent Vrooman protested against employment of any one until his plans had been presented and found satisfactory.

A student committee presented the following petition regarding the oratorical work:

Inasmuch as there is a movement on foot to place the department of Oratory and Physical Culture at the Kansas State Agricultural College in the background, we, the undersigned students, believing this to be one of the most important departments of the institution, wish to have the committee on course of study and the Board of Regents distinctly understand that we are opposed to having anything done which will in any way embarrass said department of Oratory and Physical Culture.

Further, we wish to testify to the fact that Professor and Mrs. Metcalf's work in the institution during the past two years has been most commendable, and we believe that no person who has been in touch with their work will have anything but words of appreciation to offer in regard to it.

Therefore, having perfect confidence in Professor Metcalf's ability as an instructor, and believing that he knows more about the needs of his department than anyone else, we petition the committee on course of study and the Board of Regents to give due consideration to all that he may have to offer in regard to his department.

Board declined an offer of \$700 for land in Dickinson county.

The question of sewer construction was referred to buildings committee.

The question of Doctor Lyman's bill for treating Mr. Mitchell was called up from committee. Regent Vrooman moved that it be paid. It was, however, referred to the same committee. Later it was again called up. The committee made no recommendation. An opinion from Attorney-General Godard was read to the effect that he was unable to state whether or not the bill should be paid. Regent McDowell moved that the bill be rejected. Secretary Will recommended that it be allowed, and the board so voted.

The farmers' institute fund was made immediately available.

Degrees of Master of Science and Bachelor of Science were voted as published in commencement program.

Professor Harper's plans for additions to the mechanical building were accepted. Professor Harper was instructed to receive bids, to purchase machinery and other equipment for mechanical department, and boilers for boiler house, subject to approval of president of board. Notice was issued to contractors and builders that until 12:00 M., July 10, sealed proposals would be received at the College for furnishing material and erecting extension to shops and boiler house, contractor being required to file satisfactory bond.

The following resolution was passed:

Resolved, That the interest of the Kansas State Agricultural College requires that the services of the following named officers and professors of this college be dispensed with after June 30, 1899: President Will, Professor Bemis, Professor Ward, Professor Parsons, Secretary Phipps.

The vote stood as follows: ayes—Fairchild, Yoe, McDowell, Satterthwaite, Hunter; noes—St. John, Vrooman.

The Dairy barn was located on the plot north of the armory building and west of the stone barn.

Professors Walters and Cottrell were authorized to prepare plans for a sanitary barn for eighty cows, said plans to be forwarded to the president of board, that bids for construction might be called for.

The size and circulation of the commencement number of THE INDUSTRIALIST was limited to the amount of paper on hand.

Regent Vrooman offered the following resolution, Regent St. John seconding the same:

Resolved, That the board of regents tender the position of president of the State Agricultural College to Ex-President Geo. T. Fairchild, of Berea, Ky.

On motion of Regent Satterthwaite the resolution was referred to the committee on faculty, Pres. E. T. Fairchild, chairman.

Questions pertaining to course of study were left to Regent Fairchild and faculty committee on same.

Dining hall department reported a balance on hand of \$39.24, not

including Mrs. Hanson's salary. It was voted that the above constitute her total cash salary for the period beginning with the reopening of the dining hall and ending June 8.

On motion of Regent McDowell, the following resolution passed:

WHEREAS, The minutes of the board of regents, of the meeting held January 2-7, 1899, show that the then president of the said board of regents, J. N. Limbocker, was authorized to enter into contract with the following-named members of the faculty: namely, President Will, Professor Bemis, Professor Parsons, Professor Metcalf, Professor Ward, Professor Walters, Miss Helen J. Wescott (librarian), Miss Harriet Howell (superintendent of sewing), Professor Winston, Professor Cottrell, Professor Emch, Professor Harper, Professor Fischer and Professor Weida; and further that said contracts were to run until June 30, 1901; and

WHEREAS, The secretary of this board, President Will, now informs us that there is no official record of any such contracts having been entered into between any of the parties aforesaid and J. N. Limbocker, excepting in the case of President Will, who orally states that he has entered into such contract,

Resolved, That the above statement be made a part of the minutes of this session.

The following persons were reëlected to their present positions in the faculty for one year from July 1: Professors Cottrell, Hitchcock, Willard, Weida, Stoner, Walters, Winston, Harper, Brown, Nichols, Fischer, Miss Rupp, Miss Harper. Professor E. A. Popenoe was elected professor of horticulture and entomology. Foreman J. D. Rickman was elected to succeed Supt. C. S. Davis of the Printing department. A department of Domestic Art was created and Miss Harriet Howell was elected to the same. Messrs. House, R. W. Clothier, Kellogg, Harrold, Mitchell, R. H. Brown, Otis, and Lund were reëlected to their present positions, as were Misses Helder and Long. Mr. J. M. Westgate was elected to succeed Mr. George L. Clothier as botanical assistant in Experiment Station. Miss Florence Corbett was made assistant in domestic science; Miss May Secrest, assistant in domestic art; Miss Lorena E. Clemons, secretary; Mr. Wm. Anderson, mathematical assistant on half time; Mr. F. H. Leighton, assistant in dairying; Mr. H. Van Leeuwen, assistant in cheesemaking; Dr. Septimus Sisson, assistant veterinarian and associate professor of veterinary science; Miss Josephine Berry, librarian; Misses Gertrude Barnes and Margaret Minis, assistant librarians.

The question of continuing the departments of Graphics and Oratory was deferred until the July meeting.

On motion, Prof. E. R. Nichols was elected acting president of the College after June 30, 1899.

Board adjourned until 3:00 P. M., July 10, subject to call of the president.

THE ISSUE.

BY THOS. E. WILL.

IN the *Douglass Tribune* for June 16, Regent Satterthwaite discusses the recent changes in the faculty of this College, preparatory to marked changes in the policy of the institution. He discusses the subject in a kindly spirit, shows that the board had no charges against the professors removed, concedes that these men were exceptionally strong, but insists that the institution was tending away from agriculture and mechanic arts toward economic and political science, and holds that this tendency must be counteracted. Of the efficiency of the present administration for the objects sought, he says:

When the former board of regents had promoted Professor Will from the chair of economics to the presidency of the institution he had surrounded himself with a corps of able instructors whose ideas were like his and whose minds were in like channels. We must give to President Will the credit of making excellent selections, and for perfecting a splendid organization for the purpose which seemed uppermost in his mind, viz: Making the Kansas State Agricultural College first a school of political economy after the ideas of his own heart, and then a school of agricultural and mechanical science.

The new board were confronted by "the duty of restoring the College to the purposes for which it was originally established, and for which it is at great expense maintained," and conducting it—

on agricultural and mechanical lines and not upon political lines. . . . Some, if not all, of the men removed were scholars in a high sense, and gentlemen of pleasant address and presentation. . . . In *lopping off* this most prominent political and economic feature, that more prominence might be given to practical and to agricultural education, of course it was necessary to remove the strongest men in political science and economics. . . . The removals were made that the College might be restored to practical, industrial lines, from political and theoretical grooves.

That perfunctory teaching of old-school economics and civics would have been molested many will doubt, especially those familiar with the statements made by the regents to the dismissed professors. But, making all allowance for the influence of divergent economic views and party bias, it is evident from the regent's statement that the deeper issue is, Shall or shall not the student be educated for intelligent citizenship? The board, he says—

did not get near the question of partisan politics before they were met in the road by the duty of restoring the College to the purposes for which it was originally established. . . . It would have mattered not if the political and

economic theories had been in perfect accord with the ideas of the new board of regents—their duties would have been the same. The powers that created and maintained the College have a right to demand and do demand that the institution be conducted on agricultural and mechanical lines and not upon political lines, no matter what the political brand or kind. . . . Two of the men removed are "gold standard" men—three of them at least do not advocate the free coinage of silver at 16 to 1 as the best financial policy.

These admissions help to clear the air. A distinct advance will have been made in the Agricultural College controversy, now two years old, when it is recognized that the populist board did not remove professors because they were republicans but because they were nonprogressive in their several lines of work, and that the republican board did not remove professors primarily because they were called populists, but because they taught economics and civics, taught in a thought-compelling way, and stood for the enlightenment of the people on all aspects of the great economic, social and political issues of the day, hewing to the line wherever the chips might fall. The populist board favored such enlightenment by competent men, whether these men held or rejected the views of the board. They boldly declared for absolute freedom of science, whatever might be the result, and admittedly maintained such freedom thruout the two years of their administration. The republican board, by their own admission, oppose, save in meager measure, economic and sociological studies by whomsoever conducted, at least in a college supported by the people and devoted to the education of the producing classes; and the fact that such instruction is given by teachers thoroly prepared from every standpoint, and conceded to be as fair as mortal men can be, makes no difference.

Additional light is shed on the question of opposition to civic intelligence by a letter brought me in hot haste by special delivery as I write. It is from the state superintendent of public instruction, who urges me to cut from my set of civics questions, prepared for teachers of Kansas youth, a question on the initiative and referendum, and reminds me of the action of three months since whereby my republican colleagues on the state board of education required me to suppress a question calling for the pros and cons of proportional representation.

That the new board, in assuming the institution to be tending away from agriculture, mechanic arts, and related sciences, was wholly in error, the writer had already demonstrated in an article on the "Tendencies of the K. S. A. C.," published in the May number of

THE INDUSTRIALIST. The contention of that article stands absolutely unshaken. That the College in the past two years has made unprecedented progress along the special lines marked out for it in the federal laws of 1862 and 1890 may be assumed to be conceded even by critics of the teaching of economic science, while the corroborative testimony of the agricultural press is unmistakable and overwhelming.

The writer's idea of the true function of a land-grant college is well known. He has expressed it at length in his biennial report, and in his many educational articles and addresses, several of which have appeared in *THE INDUSTRIALIST*, and have thus been made available to the people of Kansas. In a word, he believes that such a college can help the agricultural and industrial classes out of the wilderness; and that it should do this, first, by making them efficient producers, that general wealth may be increased and the services of these individual producers brought into demand; and, second, by making them intelligent citizens, that they may protect themselves against monopolies and trusts and political bosses and whatever other forces and agencies tend to hold them in a condition of semi-serfdom.

The board believes in seeking the first of these ends and in ignoring the second. They would teach students to produce, but would not empower them to share. They would make of them workers, but not intelligent citizens.

Here, then, we frankly, admittedly, and radically differ. Emerson advises each to plant his feet on the rock of eternal principle and stay there, assuring him that in time the whole world will come around to him. The writer, for one, is willing to wait and see whether the world comes around to his position or sustains that of the board. Time will decide whether it is best that the producing classes shall be taught simply to produce, regardless of what becomes of the product and the producer, or taught to perform skillfully and nobly their parts both as efficient toilers in the world's harvest field and as strong, intelligent, roundly developed, open-eyed men and women, freemen in mind, and worthy citizens of the great state whose history is a record of the warfare for freedom and of the nation whose mission it is to enlighten the world and proclaim liberty thruout all the land unto all the inhabitants thereof.

Drudges or men—which shall it be?

ANNOUNCEMENTS FOR 1899-1900.

THE next college year will begin Wednesday, September 13, 1899. Some slight changes in the length of terms should be noted. The fall term will be from Wednesday, September 13, 1899, to Friday, December 15, 1899. The winter term will begin Wednesday, January 3, 1900, and close Friday, March 24, 1900. The spring term will begin Tuesday, March 27, 1900, and close with commencement day, Friday, June 14, 1900. The length of terms in weeks will be 13, 12 and 11, respectively, instead of 14, 12 and 10 as formerly.

Four courses of study are offered which require four years for completion. The courses are: Agricultural, Mechanical Engineering, Household Economics and General Science. The work of the first year is the same in all courses, thus enabling the student to get some idea of his tastes and powers before choosing a particular course. The courses are so arranged that the students are expected to spend about 50 hours per week on study and recitations, including industrial work. A preparatory department will be maintained for those who cannot make the necessary preparation at home. This will give opportunity also for those to make up partial deficiencies while taking some of the regular college studies.

There will be introduced the coming college year some short courses designed primarily for those persons, young or old, who have neither time nor means to take the four years' course, and yet who can spend a limited time here to their own advantage.

The short course in household economics will consist of two terms of 12 weeks each, to be given during the fall terms of the regular college work. The first term will commence Tuesday, September 19, 1899. The following subjects will be taught principally by lectures:

Lectures and laboratory practise in cooking, 15 hours per week.

Home sanitation and household accounts, 1 hour per week.

Drawing, 5 hours per week.

Sewing, 20 hours per week.

Vegetable gardening and floriculture, 5 hours per week.

During the second year these lines will be extended and others introduced.

Short courses in agriculture, horticulture and mechanics, occupying two terms of 12 weeks each, will be offered during the winter

term; also a dairy course of 12 weeks will be given at the same time. These courses will begin Wednesday, January 3, 1900. A further announcement of the specific work taken up in the above will appear later. There are no requirements for admission to these short courses.

A few changes in the four years' course are made, to balance the work, in some instances, and in others to give a more logical order to studies. The regents and faculty, in making the course of study, have had in mind the principle that a general knowledge of many subjects is necessary to a special knowledge of a few—that the inter-relations of the various branches of science is such that one cannot become proficient in one without a considerable knowledge of all the related branches. While the industrial features will be retained, it should be borne in mind that the object of a course of study is to develop the power to think as well as to do. Correct thinking must precede correct doing. It is believed that each of these courses offers a good foundation for future work along its particular line, whether that work be in actual practise or further study.

In the near future a full announcement of the regular courses of study will be made.



PHYSICAL GEOGRAPHY. By William M. Davis, of Harvard University, and William H. Synder, of Worcester Academy. Half leather, pp. 428, nine plates $5\frac{1}{2}$ by $7\frac{1}{2}$ inches. Boston: Ginn & Co.

It is noteworthy that the recent books on physical geography are adopting the smaller page instead of the larger pages of similar books published ten years ago. In fact, the excellence of several of these modern books makes Physical geography a very desirable study for our Kansas high schools, if the teachers will make the proper effort to arouse interest and scientific spirit.

G. F. W.

ELEMENTS OF TRIGONOMETRY WITH TABLES. By Herbert C. Whitaker, Ph. D. Cloth, pp. xvi, 182. Philadelphia: Eldrege & Brother.

This book is an excellent treatise on the elements of trigonometry. According to the author, "The introduction and first five chapters have been prepared for the use of beginners in the subject. The second appendix has been added for those intending to take up work in higher mathematics."

A. E.

FARM FOR SALE—110 acres; 3 miles northwest of the Kansas State Agricultural College; 20 acres of Apple Orchard; Stone Barn for 8 horses. Stone House, 40 by 40 feet, two stories. A good place for a man with children to send to College. Address A. J. WHITE, Manhattan, Kansas.

LOCAL NOTES.

Miss Mary C. Lee, '89, took the degree of A. B., from the State University, at this Commencement.

The Manhattan high school graduating exercises took place May 25. The class consisted of 65 members.

The Farm department's latest bulletin is entitled "Skim-Milk Calves." The edition consisted of 15,000 copies.

Mrs. Fannie Waugh Davis, '91, has been engaged to furnish illustrations for a new cyclopedia of horticulture.

Miss Adelaide Short left, on Wednesday after Commencement, for Colorado, where she will make her future home.

Miss Marie Haulenbeck, of Manhattan, has received an appointment as teacher at the Blind Asylum, at Kansas City, Kan.

Prof. F. H. White, formerly of this College, has accepted a position in the Brooklyn, N. Y., University at a salary of \$1,800 a year.

Mr. L. R. Elliott, an old resident of the city, and for many years the land agent of the Agricultural College, died, May 27, at his home in Manhattan.

W. E. Thackrey, '96, writes from Crestone, Colo., that he is still engaged in teaching, and expects to take examination as manual training teacher in the Indian service.

The cold-storage department of the Armour Packing Co., of Kansas City, has asked for 500 copies of bulletin No. 84, on "Cold Storage for Fruit," to distribute among its patrons.

There is an article in *The Coming Nation* by Elbridge Gale, on "Colonies and the Christian Church." Mr. Gale of Lake Worth, Florida, was professor of botany and horticulture in this College in the early 70's.

The *Nationalist* contains a long letter from Philip Fox, '97, telling of the fighting before Malolos. Philip is having a hot time. He sends reports of Mark Wheeler, Ned Green, and Sam Dolby, all of the class of '97.

The editor of the *Western Agriculturist and Live Stock Journal* writes in regard to the mimeograph station bulletins: "We appreciate the letters, and use everything relating to live stock in the *Stock Journal*."

Miss Elizabeth M. Tunnell, daughter of Rev. R. M. Tunnell, of Manhattan, graduated from Washburn College, Topeka, last week. Miss May H. Bowen, '96, also of Manhattan, graduated from the same institution. Miss Tunnell was a student in the Agricultural College two years ago.

In the Argentine Republic the bulletins of the department of agriculture are printed at the national penitentiary. A book has just been received from Buenos Ayres entitled, "Lands, Colonies, and Agriculture."

Percival J. Parrott, assistant in entomology in this institution, was among those who received the master's degree this June; he was made master of arts by the State University, from which he graduated a few years ago.

Professor Stoner intends to spend her summer vacation at Battle Creek, Mich., and at her mother's home at Hometown, Ind. She expects also to visit Chautauqua, N. Y., and attend the session of the national cooking teachers' association.

J. F. Odle, '94, writes from Madison, Wis. (434 Lorch street): "Neither the rigorous Wisconsin winter nor the prowling microbe have succeeded in lowering my vitality, but I am still on the earth, and want THE INDUSTRIALIST to continue visiting me."

Professor Walters has presented the library with large photographic plates of the graduating classes of '81, '82, '83, and '97. It is to be hoped that these plates will be framed and given a place on the walls of some public room of the College. An institution without a past is like a nation without a history.

In speaking of Professor Emch's series of articles on "Link Motions," published in THE INDUSTRIALIST, the Otterbein University *Egis* says: "The reader who will follow closely the mathematics of the articles will find much valuable information in the proposed applications of modern geometry to mechanics."

Messrs. Willard and Clothier have been busy since Commencement preparing an experiment station bulletin. It will give the most important results reached in their studies of soil moisture during the last two years and means of conserving it. The bulletin will be issued as number 89, and will be sent to all farmers applying.

One of the most successful years in the history of the College has just drawn to a close. The attendance has been larger than ever before, the students have done excellent work, and developed a great deal of college spirit and enthusiasm. The degree of bachelor of science was conferred upon fifty-three young people, and the degree of master of science was conferred upon nine.—*Kansas City Journal*.

Mr. Phil. S. Creager, '91, news editor of the *Kansas City Journal*, and Miss Weenonah Hall were married at the home of the bride's brother, Mr. Clifford F. Hall, 3530 Kenwood avenue, Kansas City, May 18, at 5 o'clock. Dr. Henry Hopkins officiated. Only immediate relatives attended. Mr. and Mrs. Creager left at once for an eastern trip which will include Washington, Philadelphia, New York, Boston, Albany, Buffalo and Detroit. They will be at home, after July 1, at 3302 Woodland avenue, Kansas City. THE INDUSTRIALIST wishes them a happy and prosperous married life.

There are over eighty names enrolled in the Riley county institute now in session at Manhattan. Prof. E. T. Fairchild, president of the board of regents, is the conductor, and Prof. E. R. Nichols, temporary president-elect of this College, is one of the instructors. Over two-thirds of the attending teachers and candidates have been students at this College, and all report a very social and profitable institute.

The most amusing incident of the season was the senior faculty ball game, May 22. The seniors commenced the game, confident of success, but their hopes were blasted, and the faculty let them down by a score of 21 to 12. Tho the game was full of grand-stand plays, Professor Hitchcock's slide on second and Mr. True's gentle fall on the Professor's back were the most mirth-provoking. The seniors played "work-up."—*Students' Herald*.

The last number of the *Mathematical Monthly* contains an article by Prof. A. Emch. "On Loxodromic Lines of the Torus"—a generalization of a theorem published by him last year in the *Program* of the Polytechnic of Biel. Another article from the same prolific pen, containing a mathematical proposition for a novel improvement of the driving mechanism of the bicycle, under the title "Chain and Sprocket Problem," appeared in the last number of the *Scientific American*.

Mr. S. Detweiler, of Hiawatha, writes: "I notice an article in the *Kansas Farmer* of recent date on 'Seed Breeding' which to my mind is susceptible of great possibilities. Seed selection, a matter too long neglected by farmers, is, I am glad to know, receiving more attention than formerly, but is yet in its infancy. By properly cleaning and screening my seed wheat, I have raised the average on my farm from 8 to 10 bushels to the acre. Have been impressed for years that if the pollen from degenerate and unfruitful stalks could be prevented from fertilizing it would be a grand attainment. If there is any manner in which I can be of any assistance let me know."

The address before the Alumni association, Wednesday of commencement week, was given by John W. Shartel, '84, of Oklahoma City. Mr. Shartel is one of the leading lawyers of Oklahoma. His address was a very timely one, being a clear and logical analysis of the relation of the American constitution to the modern trust. The tremendous changes that have taken place in the means of production and transportation could not have been anticipated by the framers of the constitution; and, in the judgment of the lecturer, consolidated capital can be held in check only when this instrument has been suitably amended. He thought that this would require a strengthening of the central power, and the sacrifice of certain rights now retained by the states.

Among the interesting sights of commencement week was an experiment in the chemical laboratory by Mr. A. T. Kinsley of the graduating class. The current statements concerning the effects of oxygen upon animal life being so various and contradictory, Mr. Kinsley took that subject for his graduating thesis. In successive

experiments he kept a cat, a rabbit and two chickens in a respiration chamber thru which a current of pure oxygen was passing. The time of confinement varied from 18 to 53 hours. The cat and the rabbit showed an increased rate of respiration at first, but otherwise no effect was shown. To emphasize the results, two chickens were kept in the chamber from Friday, June 2. to one week from that date, the oxygen giving out about two hours before the completion of the full week. The chickens suffered no inconvenience whatever, arrangements being provided in the apparatus to feed and water them regularly.

Prof. J. W. Towney, of the Division of Forestry, spent several days in May studying the condition of the forestry plantations at this College. The division has added about seventy-five thousand trees, mostly conifers, to its plantation on the college farm within the last four years. Several other plantations have been maintained in the West, but none of them have been so successful as the one under the control of the Horticultural department at this place. Professor Towney says that the plan of the government for the future is to add no more to the plantations, but largely to increase the publication of useful information on matters pertaining to forestry and tree planting. It is also planned to make this College a distributing point for seeds and seedlings of hardy trees. The aim of the division will be to encourage planting among the farmers rather than to make large plantations itself. This will without doubt arouse great interest in tree planting among the people of the central and western part of the country.

At a business meeting of the alumni, June 8, plans were considered whereby the alumni might become more effective in increasing the influence of the College thru the state, and also extend more effective help in increasing the attendance at College. A committee was appointed to take charge of this work: four from college employees (J. T. Willard, '83; H. M. Cottrell, '84; R. S. Kellogg, '96 and W. L. Hall, '98;) and five from the state at large (M. F. Leasure, '77; H. C. Rushmore, '79; J. W. Berry, '83; F. J. Smith, '95 and T. M. Robertson, '97). This committee has been unable as yet to meet, and the college members have taken the liberty to issue a circular. They have arranged that every graduate shall receive the college catalog and the bulletins of the Experiment Station. R. S. Kellogg, '96, Manhattan, Kansas, has been appointed alumnus editor of the *Students' Herald* and all alumni are requested to write him at least once every three months, telling all the news about the old K. S. A. C. students in his section. The alumni can help the College by bringing its work before the leading farmers, business men, statesmen and newspapers of the state, and by helping the College to place its catalogs and circulars in the hands of the teachers and schools of the state.

The New York *Produce Review* speaks of our press bulletins in the following handsome manner: "We desire in this public manner to commend the methods of the State Experiment Station at Kansas Agricultural College. The gentlemen engaged in the work of investi-

gation at that station are hard workers and are evidently directing their energies toward a great variety of subjects of every-day practise on the farm and in the factory. They derive from their investigations a fund of information of practical value which is immediately scattered broadcast to the agricultural community thru the columns of the press. It is this method of bringing the results of their work to the attention of those most interested that we especially commend. The experiment station bulletin must, of course, be used to a large extent in spreading and preserving in record the work of these institutions, but the columns of the agricultural press afford a quicker and cheaper method of dissemination, and should be more largely used. Those who are most likely to benefit by the results of scientific investigation are generally readers of the agricultural journals, and the latter are always ready to give space to results of experimental research. The Kansas people have the right idea in this matter, and we respectfully suggest the same plan to directors of other experiment stations."

THE CHARLES SILLY BEQUEST.

The following is excerpted from the *Topeka Journal*, May 22, 1899:

Charles Silly is a Frenchman who came to Kansas in 1874, about the time De Boissiere founded the Silkville farm, now known as the I. O. O. F. Orphans' home. He owned about 240 acres of fine, well-improved land in Franklin and Coffey counties, valued by him at \$5,000, some money in the bank and some property in France. He lived a solitary life, caring for no one's society.

April 1, 1899, he sent a neighbor's boy to ask F. L. Williams, manager of the Buckeye agency, Agricola, Kan., to come over, as he wished to see him. The Silly farms join the Williams farm on the north and west. The dwellings are about eighty rods apart. Silly and Williams were not intimate.

Mr. Williams found his neighbor suffering from rheumatism, and called a Waverly doctor by wire. On the 5th of April, Mr. Silly went to Bethany hospital, Kansas City, Kansas, where he remained until cured; and then he left for California, where he will purchase a small home in a more suitable climate.

He gave all his property in America, except a buried treasure, to F. L. Williams, in trust for worthy, white, male students to aid them in securing an education at the State Agricultural College, at Manhattan, Kansas. Mr. Silly said: "It isn't much, but it will help a little, and I think the boys will make better citizens if they can go to school at the Agricultural College."

He knew that Mr. Williams borrowed money in 1882 to attend school and that he was borrowing money to aid a friend to attend the Agricultural College.

When Mr. Williams asked the question if he, Silly, understood that Williams would have the power to act the rascal, he replied: "Yes, but I do not think you will. You have worked hard, attended to your own business, and I have full confidence in you. I often see a light in your window as late as 10 or 12 o'clock at night when you are writing."

The plan is to aid those who actually need the help and could hardly get it elsewhere. It is to be hoped that all who are aided by the fund will live lives worthy of such help.

Any reader of THE INDUSTRIALIST knowing a deserving boy who really needs aid and wishes to attend the Agricultural College should inform the trustee, Mr. F. L. Williams, of Agricola, Kansas, of the fact. The plan is to make the loans as small and short as possible so as to aid as many as can be reached. The trustee knows from experience that a boy once placed on his feet, will take care of himself, if he cares to do so.

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Your "Stylebook and Manual of Typography" is an interesting one. I have gone thru it and know that it possesses much interest and merit, and that it will be remarkably helpful to those who expect to become practical printers.—*Lewis D. Sampson, Director Special Course in Journalism, Northern Indiana Normal College*.

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We are very much pleased with the compactness and value of your "Stylebook and Manual of Typography." We think your article on type bodies covers the subject very thoroly. You are right in your statement that the destruction of Marder, Luse & Co.'s old punches in the Chicago fire of '71 was really the first impetus to the adoption of the new system [of type bodies], which Marder, Luse & Co. had had in contemplation some time.—*Am. Type Founders' Company, Chicago, Aug. 18, '98*.

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It is not expected that all will conform to every rule, but it will be found of great value as a book of reference. Great care has been taken in its preparation, and its contents, if well studied, will help the compositor and the proofreader as well as those who prepare copy for the press.—*Idaho Springs (Colo.) News, May 19, 1899*.

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"VALUABLE IN ANY PRINTING OFFICE."

The Kansas State Agricultural College Printing department has just issued a "Stylebook and Manual of Typography." It covers 16 pages and takes up and treats thoroly the subjects. It is intended, we presume, to be used principally as a text-book in the Printing department. The booklet will be valuable in any printing office.—*Junction City Union*.

"A FONT OF USEFUL INFORMATION."

This office is under obligations to Charles S. Davis, superintendent of printing at the State Agricultural College, for a copy of the "Stylebook and Manual of Typography" recently issued from the College Press. To a beginner and even to an "old hand" the little pamphlet is of great value as a refresher of memory, a book of reference and a font of useful information. Having educated several typos, we have often felt the need of just such a little book to put into the hands of the beginner to study and be guided by. The price of the little book is 10 cents.—*LeRoy Reporter, Aug. 26, '98*.

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In ordering several copies of the K. S. A. C. Stylebook, Henry R. Boss, for the publishers of the Stylebook of the Chicago Society of Proofreaders, says: "There is much that is admirable in your work. We are especially gratified at the stand you take on the question of spelling. In this work your book will render important aid."

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Please pardon me for not thanking you before for the "Stylebook and Manual of Typography" sent. I have referred to it many times and expect to many more.—*R. H. Elsworth, with the Inland Press, University of Michigan, Feb. 16, '99*.

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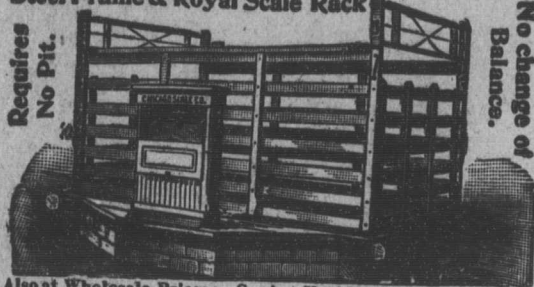
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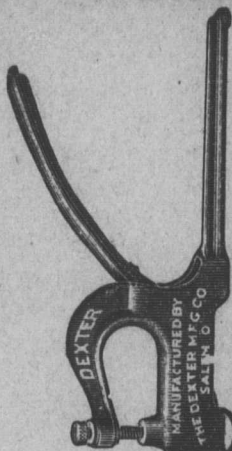
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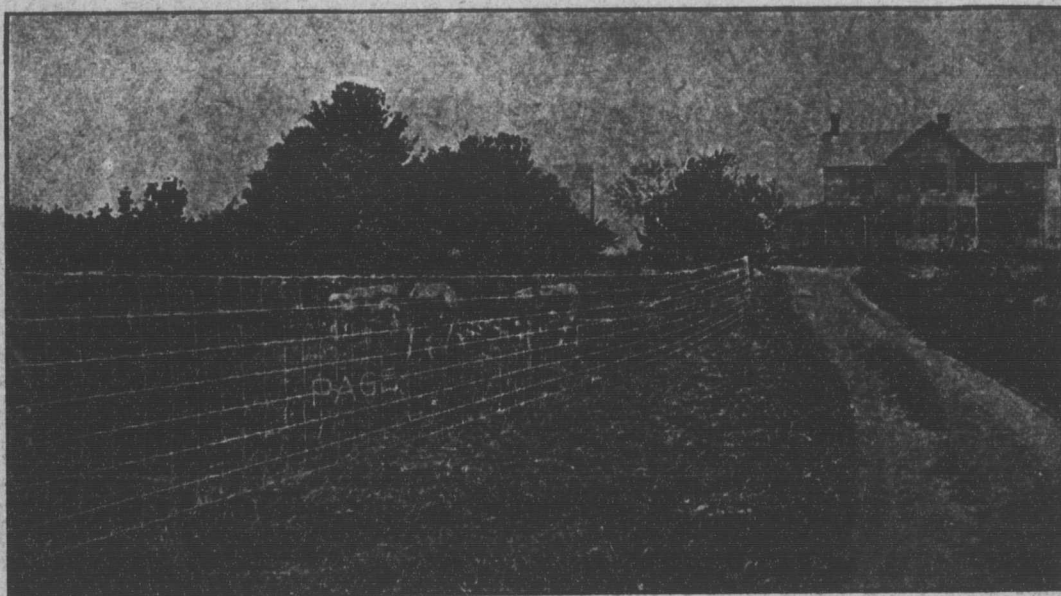
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